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STEEL

The Magazine of Metalworking and Metalproducing

VOL. 125, NO. 17 — OCTOBER 24, 1949

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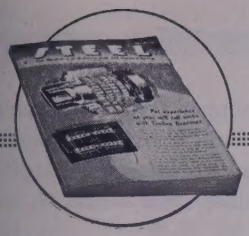

October 24, 1949

Unbalanced Progress

Many of the tens of thousands who visited the 1949 Metal Congress and Exposition in Cleveland last week must have been impressed anew by the manner in which this annual event accurately mirrors progress in the metalworking industries. If it had been possible for visitors to compare each 1949 exhibit with its counterpart at the 1939 show, or to consider the content of technical papers presented last week in relation to that of papers presented at the 1939 Congress, they would have been amazed at the remarkable advances that have been made during this exciting decade.

As pointed out elsewhere in this issue, these advances stem from a system of harmonious relations between science and shop which has been developed to a higher degree of refinement in the United States than in any other industrial nation. The lag between the time a basic idea comes from the research laboratory and the time it is translated into a part or machine in actual production is being reduced steadily. Manufacturers are more alert than heretofore to grasp the potentialities of new inventions, new materials, new machines and new processes.

Much of this alertness may be attributed to the economic pressure of this period, which calls for extraordinary ingenuity in reducing the costs of manufacture. The several hundred exhibits and the scores of papers discussed at technical sessions provided thousands of ideas which, applied properly to industry's production and manufacturing problems, can reduce costs appreciably. The 1949 Metal Congress and Exposition far exceeded expectations in the degree with which it justified its timely theme, "Economy in Production."

This highly successful event was held at a time when two of the nation's major basic industries were strike-bound. In this atmosphere, the brilliant achievements of our industries in technology, as reflected at the Cleveland show, stand out in sharp contrast to our continued difficulties in dealing with the human element in the productivity equation.

Through intelligent concentration of effort we seem to have harnessed the forces for effective progress in the physical aspects of production. It remains for us to direct the same kind of concentrated attention to the objectives of harmony between employer and employee and contentment of man with his job.

* * *

CONSIDER THE OWNERS!: Last week Henry F. Holthusen, a New York attorney who owns stock in Inland Steel Co. and Youngstown Sheet & Tube Co., wrote letters to the presidents of these companies urging that stockholders be consulted before management commits the companies to pension and insurance plans.

Mr. Holthusen wrote that until recently labor's demands related to wages and working conditions, which problems clearly are a function of management. Now the insurance and pension proposals involve such heavy drains upon current earnings and accumulated assets that it is doubtful whether management has the power to commit companies without stockholder consent.

This is a strong argument. In most companies management would not dare propose a pension plan on its own initiative without first obtaining approval of directors. In some companies, the directors would insist upon putting the proposition up to the stockholders. When a plan originates from the demands of a union—especially if the demands are on an industry-wide basis—the propriety of obtaining stock-

(OVER)

holder consent is even more pronounced than if the plan had originated with management.

Stockholders constitute a representative cross-section of the American public. In many companies the number of stockholders exceeds the number of employees. Whether or not a company's by-laws provide that pensions be referred to stockholders, management is bound morally to discharge its obligation to owners as assiduously as it meets its obligation to employees. —pp. 29, 30

* * *

CONTINUOUS TUBE MILL: In Part II of "Production of Seamless Steel and Tubes," Author Bryant Bannister, consulting engineer of National Tube Co., describes the "continuous" tube rolling process and discusses its possibilities.

Principal equipment for "continuous" rolling includes a rotary billet heating furnace, cone type Mannesman piercing mill, nine-stand continuous rolling mill, reheating furnace and universal stretch reducing mill. An installation of this kind now under construction by National Tube Co. is designed to deliver pipe 65 feet long in sizes from 2 to 4½ inches OD at rates up to 900 feet per minute out of the last stand of rolls. From the stretch reducing mill lengths up to 400 feet and delivery rates as high as 2200 feet per minute will be attained.

This maximum delivery rate—25 miles of pipe per hour—probably will not be achieved in actual production for obvious reasons. Nevertheless the output will exceed that of orthodox tube mills by such a margin that the "continuous" feature may be termed revolutionary. —p. 68

* * *

STEEL IN SMALL HOMES: American Iron & Steel Institute finds that as of September, 1949, an average six-room house takes about 3.5 tons of steel products. This is about double the poundage consumed in 1938.

Principal uses for steel in today's six-room house are 1800 pounds of steel lath; 1200 pounds of pipe for gas, water and heating (1.5 tons additional for radiant heating); nails and miscellaneous wire, 600 pounds; gutters and downspouts, 475 pounds; flashing, 200 pounds; hardware, 90 pounds; steel conduit, 140 pounds; heating system, 300 to 800 pounds; bathroom, 300 pounds; and kitchen equipment, 800 pounds. There may be other uses for steel, such as window frames, angles for lintels, I beams for floor joist supports, steel columns and railings.

Steel faces stiff competition in some of these applications. Rock lath versus steel lath, copper versus steel for pipe, copper against galvanized sheets for flashing, and aluminum compared with steel for window frames are sharply competitive. In spite of this, steel seems to be gaining ground. —p. 40

* * *

CURB WATER POLLUTION: A movement which industry cannot afford to ignore is the increasing tendency on the part of municipal, state and federal governments to do something about water pollution. The metalworking industries come into the situation prominently because their use of river, harbor and lake waters is one of the three major causes of contamination. The other two are public sewage disposal and soil erosion.

The problem is particularly acute in areas of heavy, industrial concentration. The largest pollution program now in progress is that administered by the Ohio River Valley Sanitation Commission which is seeking to control contamination in the 200,000-square mile Ohio river drainage basin. Another project is cleaning international boundary waters between the United States and Canada from Port Huron, Mich., to Toledo, O.

From the standpoint of self-interest as well as public interest, industry should co-operate wholeheartedly in pollution control. —p. 41

* * *

BUYING NEW EQUIPMENT: Figures compiled by the Bureau of Census reveal the breakdown of the metalworking industry's expenditures for plant and equipment in 1947. Out of a total outlay of $2375 million, $1418 million or 59.7 per cent went for new machinery and equipment, $651.9 million or 27.5 per cent was invested in new construction and $304.7 million or 12.8 per cent was expended for used plant, used equipment and land.

Percentages vary somewhat for the six subdivisions of the metalworking industry, namely primary metals, fabricated products, machinery except electrical, electrical machinery, transportation equipment and instruments, but in all instances expenditures for new equipment exceeded outlays for new construction or used plant and equipment. Especially significant is the fact that expenditures for new machinery and equipment in 1947 were 419 per cent of corresponding allotments in 1939. —p. 32

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

LABOR— Expect increasing paralysis among steel-consuming industries over the next two weeks (pp. 29, 30) unless there is a quick end to the steel strike. Effects of the steel dispute would hit Detroit auto assemblies by Oct. 31. Problems are complicated by the Aluminum Co. of America strike and by the growing number of walkouts in steel fabricating plants organized by the CIO. The steelworkers alone have already dropped about $105 million in wages the three weeks they have been off the job. The White House will probably try another mediation attempt, but President Truman denies that he is considering taking over either the steel or coal industries.

PRICING—You'll have to wait at least until next year to get any congressional clarification of the pricing muddle (p. 31). The O'Mahoney measure to define how far industry can go in absorbing freight and quoting delivered prices is stymied until the second session of Congress. A compromise bill passed the House, but the Senate has deferred action.

CAPITAL EXPENDITURES—Metalworking's 1947 expenditures for plant and equipment totaled $2375 million, says the Census Bureau (p. 32). The industry's total allotments for new machinery and equipment in 1947 was 419 per cent of that allocated in 1939. New construction expenditures were 573 per cent of the 1939 total.

STANDARDIZATION— If you are becoming increasingly cost conscious, don't overlook the possibilities in standardization (p. 33). This is the advice given at the American Standards Association meeting in New York. Speakers at the convention believe that the average company has scarcely scratched the surface in applying standardization.

METAL SHOW—Many other ways for you to cut costs were shown at the Metal Show in Cleveland (pp. 34, 35). The exhibits at the exposition indicated that a close working partnership between the laboratory and the shop is responsible for many of the cost-saving, production-improving technological advances in American industry. A query of some of the show exhibitors reveals that a wide range of techniques are used to reduce expenses: Budget control, materials handling, employee education and co-operation, materials substitution, improved plant layout, better tooling, better production scheduling, improved production equipment.

SHIPBUILDING—Look for increased pressure for more American shipbuilding next year (p. 36). Military and naval officials will back the Bland omnibus bill which would amend the Merchant Marine Act of 1936 by applying the construction-differential subsidy to all vessels operated in the United States foreign commerce.

FOREIGN— Western European steel producers hope to benefit at least temporarily from the U. S. strikes (p. 39) . Western Germany and Belgium would welcome American sales to fill their partly empty order books. British and French steelmakers could divert some tonnage for coveted dollars.

HERE AND THERE IN INDUSTRY— Too much crude oil production in California may crimp sales of oil field equipment manufacturers there (p. 33) . . . Government pressure is mounting for more control of water pollution (p. 41) . . . Demand for metalworking products was swelled by the record 100,000 new nonfarm dwelling starts in September (p. 40) . . . Plans are under way for streamlining and improving collection of federal income tax and other tax withheld from employee wages (p. 38) . . . Large new market soon to be opened to metalworking is through mechanization of the cotton industry (p. 38) . . . Currency devaluations are bringing lower prices for welding electrodes and other products being marketed by North American Philips Co. Inc. . . . A new method of welding steel tubing has been developed by Ohio Crankshaft Co. and Yoder Co., both of Cleveland (p. 32).

Engineering News, p. 57 *Market Summary, p. 97*

A Report on the Steel Situation at Ryerson

As this is written,* a strike settlement is not in sight, but we're still able to furnish a fair share of most requirements from stocks on hand. Naturally, with heavy demand and the complete curtailment of supply, our stocks of some kinds and sizes have been sharply depleted. But every day we are filling hundreds of orders for carbon, alloy and stainless steels—and we will continue to fill orders, at our established prices.

Our technical men will make every effort to find workable alternates when the steel you need is not on hand. As always, you can be sure that Ryerson steels are of high, uniform quality. And you can depend on accurate cutting as well as prompt delivery.

When the strike ends (and we hope it will end before this appears), we will quickly rebuild our stocks so that every steel will again be available. In the meantime, we'll continue to do our level best to meet your requirements. So continue to call us when you need steel.

*Thursday, October 20

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STEEL
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teel Inventories Dwindle

Next two weeks to bring many metalworking plant closings if steel strike continues. Industry expects federal intervention but President denies seizure plans

'ALYSIS in the steel-consuming idstries will reach a crucial stage rtin two weeks if the steel strike on nues. This is the appraisal of etlworking executives as they ch steel inventories dwindle after re weeks of idleness in almost 90 rcent of the industry's productive ity.

me metalworking plants already redown for lack of steel. Others re operating short shifts to con- re stocks. A large number will rtail or close early in November ps the flow of steel from mills onsumers is resumed.

vait Federal Intervention — Ex- ectations that the President soon ll move in an attempt to break he stalemate between the union and rducers are heard wherever the re is discussed. First move is cted to be another mediation mpt—at the White House level. top level mediation fails, the ad- nistration may prepare to seize struck mills under the Selective ice Act, although President Tru- n says he has no plans for taking either steel or coal industries.

urray on Hook — Some action rom the White House is anticipated re the national CIO convention s in Cleveland next week end. President Philip Murray will be n unenviable position if he has to the convention with a month-old re on his hands and no prospects ettlement. His position will be e more untenable by the un- ularity of the current strike ng the rank and file steelwork- rs. Nor will it be helped by the that his leading rival for power he CIO, Walter Reuther, presi- of the United Auto Workers, negotiated a pension settlement Ford.

alemate Complete—As the third k of the stoppage ended, no kening in the position of either was apparent.

eel producers stand ready to t social insurance and pensions, only on a contributory basis.

nion leaders are attempting to s the drive for noncontributory sion and insurance as a crusade. Mr. Murray last week toured leading steelmaking centers to address strikers, promise an all-out victory and assure them that "God is on our side."

Federal conciliation and mediation chiefs are discouraged after 10 days futilely spent in talking with the steel companies and union officials.

Nine Alcoa Plants Struck

Strike of 16,000 members of United Steelworkers-CIO Oct. 17 closed nine of 25 plants of Aluminum Co. of America. Company's ingot output was cut 50 per cent.

The walkout does not affect extrusion operations at Cressona, Pa., and Lafayette, Ind., plants; ore processing at East St. Louis, Ill.; integrated melting and finishing operations at Massena, N. Y., including structural shapes, wire rod and bar mill output; magnesium foundry operations at Buffalo, die casting at Garwood, N. J. and Chicago, also permanent mold castings and forgings at Cleveland; diversified fabrication at Vernon, Calif.; sheet and plate output at Davenport, Ia.; furniture fabrication at Jamestown, N. Y.; basic aluminum reduction at Vancouver, Wash., and at Point Comfort, Tex.

Alcoa now has a noncontributory pension program to which it contributes 5 cents per man hour and an insurance plan for which it pays 2 cents. Company had offered to increase the benefits to 6 and 4 cents, respectively. However, the union flatly rejected company's proposal that the above offer be subject to future changes in "social security."

Strike Losses Mount

Directly or indirectly you are suffering losses from the steel, coal and aluminum strikes.

In the three weeks of the steel strike, 4,140,000 net tons of steel ingots have been lost. This total would have been produced if the industry had been operating at 86 per cent of capacity. Its operating rate now is only 9.5 per cent. This lost tonnage could have been converted to 3.1 million tons of finished products, worth $255 million or enough to build 2,480,000 automobiles. About 10 million tons of coal are being lost weekly because of the United Mine Workers' walkout.

An estimated 1 million are on strike today; the count is rising. Of this total, 500,000 are steelworkers, 400,000 coal miners, 16,000 Aluminum Co. of America employees, the rest in steel fabricating plants and miscellaneous categories. About 500,000 steel fabricating personnel belong to the United Steelworkers. Fabricating locals are beginning to strike.

Approximately 94,000 have been

. . . offered 6 and 4 but they struck at Alcoa's Edgewater, N. J., plant

furloughed by 36 railroads because of the coal and steel disputes. The number is mounting of nonstriking metalworking employees temporarily forced off the job or to a short week. Ultimately, all the 5.9 million metalworking employees could be affected.

Striking steelworkers have dropped $105 million in wages thus far. Coal miners are losing $30 million weekly. Uncle Sam is being hit, too, for he loses 20 cents in taxes for every dollar drop in the national income.

The effect of the coal and steel strikes is fanning out to people far afield. Retail merchants in areas predominantly coal or steel producing are being hard pressed. Community Chest drives have been postponed by several municipalities in the Youngstown-Pittsburgh region.

Strike Effects Spread

Steel and coal strikes are curtailing production at these companies:

General Motors Corp. is putting its entire automobile output on a four-day week. Elimination of Friday work is designed to stretch steel supplies until late November when the changeover to new models will begin.

Chrysler Corp. divisions have enough steel to maintain auto assemblies at the current rate until Oct. 31. At that time all divisions except Plymouth will start curtailing. Plymouth will probably be able to continue for a few days into November at the present pace.

Ford Motor Co. will have to shut down assembly lines Nov. 15 because of the coal and steel strikes. When the walkouts are settled, it will take Ford at least six weeks before it can resume full production.

Steel shortages forced Willys-Overland Motors Inc. to halt assemblies Oct. 10-24.

General Electric Co. has laid off 1700 because of steel shortages. If the steel strike continues, 6000 will be idle by Oct. 31 and refrigerator production by the company will practically cease.

Allis-Chalmers Mfg. Co. is starting to furlough 2500 because of inadequate steel supplies.

Thor Corp., which normally closes its Chicago plant for two weeks in December for inventory, will take inventory Oct. 31 because of the steel strike.

Westinghouse Electric Corp. will begin curtailing operations after Nov. 1 at its East Pittsburgh, Pa., and Mansfield, O., plants.

A Friend Indeed

LUKENS Steel Co. is issuing orders for food and fuel to employees in distress as a result of the steel strike.

"Lukens," says W. Roy Widdoes, the company's director of industrial relations, "is unwilling to see any of its employees in distress, and if families are in need of food or fuel the company will see that both are provided, to be paid for in the future."

Arrangements for food and fuel orders are being handled through George K. Irwin, supervisor of safety and personnel service.

Fabricating Picture Varies

The strike picture varies at the steel fabricating plants where the United Steelworkers have some 500,000 members. A few companies have settled—five more acceded to company-paid welfare demands last week. Some are being struck as contracts run out. The union, however, is bending over backward trying to extend as many fabricating contracts as possible, to give workers the chance to draw unemployment compensation when plants close for lack of steel.

Singer Strike Settled

The 24-week strike at Singer Mfg. Co.'s Elizabeth, N. J., plant is settled. The 7500 striking United Electrical Workers-CIO have accepted a contract which provides for no general wage increase and no abolition of the company's incentive pay system, the two main goals of the strike. This was one of the first walkouts in the nation for a fourth-round wage increase.

The contract is similar to one which ended a dispute three weeks ago at Singer's Bridgeport, Conn., plant. At that time Elizabeth union officials denounced the Bridgeport settlement as a "sellout."

Minimum Wage Bill Passed

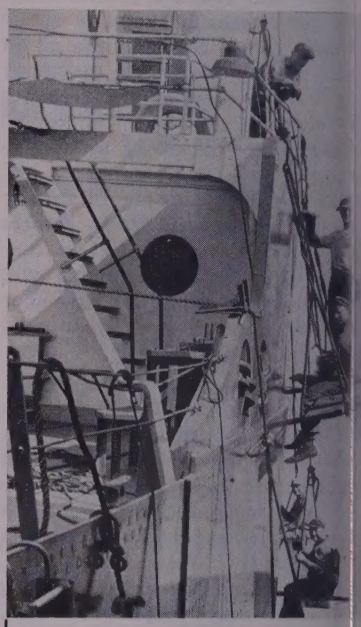
The minimum wage bill suported by President Truman squeezed through Congress last week just before adjournment. The measure raises the minimum wage to 75 cents an hour from 40 cents. Some 1.5 million workers will get boosts.

Armco, Independents Sign

A social insurance program costing slightly less than seven cents an hour has been worked out by Armco Steel Corp. and its Employee Independent Federation. The company has agreed to pay 60 per cent of the cost of the program, with the individual employee paying 40 per cent. Any dividends accruing from the insurance will be shared by the pany and the employee on this b Armco has only two plants v have contracts with the CIO u

Bell Aircraft Workers Back

Representatives of 1700 str CIO United Auto Workers an ficials of Bell Aircraft Corp. rea an agreement to end a bitter di which has halted production at Niagara Falls, N. Y., plant fo weeks. All matters in dispute w submitted to a New York board of inquiry for arbitration.



MAKING THE MOST OF Idled by the steel strike, this c carrier, like many others, is u dergoing minor repairs—in t case a coat of paint. NEA pho

Shareholders Want Say

Demand that any pension an surance grants to employees struck steel companies be subm first to stockholders is facing management of at least two producers.

Henry F. Holthusen, New Yor torney, in letters to the presi of Inland Steel Co. and Youngs Sheet & Tube Co., questions power of management to make grants without consent of s holders.

"Regardless of what might b answer to these union demands shareholders are entitled to s Perhaps a majority of the s holders favor these insurance pension plans. Perhaps they d They, surely, have power to say or 'no.' They should be grante opportunity to say so at a s holders' meeting."

cing Bill Stalled

'Mahoney measure passes in ouse but is held up by Senate ntil January

E O'MAHONEY bill to clarify far industry can go in absorbing ght costs and quoting delivered es is stalled until next year.

he bill, in compromise form devel- in a House-Senate conference mittee, passed the House 200 to but the Senate has deferred on on it until next Jan. 20, when h 81st Congress will be in its nd session.

he postponement resulted largely rn persuasive action by Senators s H. Douglas (Dem., Ill.), Russell Long (Dem., La.), and Joseph C. 'Mahoney (Dem., Wyo.), particular- y he first-named.

tes Objections—The bill in the on agreed on by a House-Senate erence committee and passed in h form by the House would, says nator Douglas, bring "re-establish- nt of the old basing-point system vi the addition of two other possi- ilities, zone pricing and postage- ip pricing, so that the leading rs in an industry would have a vi e armory of weapons.

hey are protected by this bill gnst suits by the government, and h can say 'we are doing this in- ndently merely to match the ces of our competitors,' with the lt that competitive prices will dis- ar."

ars Discriminatory Pricing—Sec- o 3 of the bill, he asserts, "would al the Robinson-Patman Act by itting a seller to make, and a r to receive, a discriminatory not granted to others, provided that it is made 'in good faith to an equally low price of a com- tor.'"

his view is mirrored also by gov- ment attorneys, who say that the ill as it came from conference, ld remove the Federal Trade mission from jurisdiction over ing."

ope Broadened—The bill that a from conference and passed the se is far broader than what its inal proponents had in mind. Key ge was substitution of the word w" for "may." As a result the bill recognizes the right to ab- r freight, when done independent- except where such absorption eight would be such that its ef- upon competition will be to sub- ially lessen competition."

he bill provides that proof of ing competition in good faith is n dequate defense against charges of price discrimination, except in conspiracies, and that charges of lessened competition due to price discrimination must be proved by "reliable, probative and substantial evidence." This contrasts with the present system under which courts uphold the orders of the FTC on the basis of any evidence as to what the effect of discrimination "may be."

Time Extended in Pricing Suit

Time limit for filing briefs on respondents' motion to dismiss the Federal Trade Commission's suit against steel companies for using a multiple basing point and delivered price system is postponed again, this time until Oct. 27. The commission granted postponement at request of the American Iron & Steel Institute.

Ceco Holds Cicero Open House

"GOOD NEIGHBOR" is the term applied to Ceco Steel Products Corp. by many of the townspeople of Cicero, Ill. They had their first opportunity to visit the company's main plant in that Chicago suburb Oct. 15. Personal invitations were extended to householders for several blocks around the plant and city officials were also invited. Ceco makes steel casements, roof deck, joists, metal lath and combination storm sash at this plant.

Leaves Metal Treaters' Group

STEWART N. Clarkson has resigned as executive secretary of the Metal Treating Institute, New York, effective in 90 days. A three-member committee including the institute's president, Fred Heinzelman Jr., is empowered to select a successor.

Iron Ore Stocks High

IRON ORE consumption dropped to 5,541,187 gross tons in September and stocks at Lake Erie docks and furnaces rose to 45,356,369 tons on Oct. 1, highest total for this year and surpassing stocks at the end of the 1948 shipping season. Consumption in September was lower than in any month this year except July and more than 1.4 million tons below the 6,965,392 tons consumed in September, 1948.

Lake Superior Iron Ore Association, Cleveland, totals show that stocks increased more than 4.5 million tons during September. Month ago and year ago stocks were 40,811,232 tons and 40,923,499 tons.

Steel Ingot Production Statistics

	Estimated Production—All Companies									
	Open Hearth		Bessemer		Electric		Total		Calculated weekly production	Number of weeks in mo.
	Net tons	Per Cent of capac.	Net tons	Per Cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	
1948										
Jan.	6,770,831	95.6	343,263	77.5	366,784	80.2	7,480,878	93.7	1,688,686	4.43
Feb.	6,247,491	94.4	340,689	82.3	359,837	84.2	6,948,017	93.1	1,678,265	4.14
Mar.	6,845,777	96.6	363,334	82.0	409,659	89.6	7,618,770	95.4	1,719,813	4.43
1st qtr.	19,864,099	95.5	1,047,286	80.6	1,136,280	84.7	22,047,665	94.1	1,695,974	13.00
Apr.	5,640,273	82.2	185,140	43.2	399,074	90.1	6,224,487	80.5	1,450,929	4.29
May	6,801,633	96.0	355,659	80.3	423,350	92.6	7,580,642	94.9	1,711,206	4.43
June	6,484,114	94.5	356,907	83.2	424,228	95.8	7,265,249	94.0	1,693,531	4.29
2nd. qtr.	18,926,020	91.0	897,706	69.0	1,246,652	92.8	21,070,378	89.9	1,619,552	13.01
1st 6 mos.	38,790,119	93.3	1,944,992	74.8	2,382,932	88.8	43,118,043	92.0	1,657,749	26.01
July	6,348,611	89.8	325,080	73.6	401,826	88.1	7,075,517	88.8	1,600,796	4.42
Aug.	6,633,443	93.6	371,306	83.8	442,085	96.7	7,446,834	93.3	1,681,001	4.43
Sept.	6,594,499	96.3	387,259	90.5	443,086	100.3	7,424,844	96.2	1,734,777	4.28
3rd. qtr.	19,576,553	93.2	1,083,645	82.6	1,286,997	95.0	21,947,195	92.7	1,671,530	13.13
9 mos.	58,366,672	93.2	3,028,637	77.4	3,669,929	90.8	65,065,238	92.2	1,662,372	39.14
Oct.	7,120,753	100.5	409,657	92.5	466,485	102.0	7,996,895	100.1	1,805,168	4.43
Nov.	6,925,043	100.9	411,161	95.9	461,354	104.2	7,797,558	100.8	1,817,613	4.29
Dec.	6,927,689	98.0	393,717	89.1	459,373	100.7	7,780,779	97.7	1,760,357	4.42
4th qtr.	20,973,485	99.8	1,214,535	92.5	1,387,212	102.3	23,575,232	99.5	1,794,158	13.14
2nd 6 mos.	40,550,038	96.5	2,298,180	87.5	2,674,209	98.6	45,522,427	96.1	1,732,867	26.27
Total	79,340,157	94.9	4,243,172	81.2	5,057,141	93.7	88,640,470	94.1	1,695,495	52.28
1949										
Jan.	7,287,683	101.1	408,552	92.6	487,260	93.8	8,183,495	100.2	1,847,290	4.43
Feb.	6,633,779	102.0	379,698	95.3	467,247	99.6	7,480,724	101.4	1,870,181	4.00
Mar.	7,473,901	103.7	430,176	97.5	483,850	93.2	8,387,927	102.7	1,893,437	4.43
1st qtr.	21,395,363	102.3	1,218,426	95.2	1,438,357	95.4	24,052,146	101.5	1,870,307	12.86
Apr.	7,015,611	100.5	404,095	94.6	365,570	72.7	7,785,276	98.4	1,814,750	4.29
May	6,889,230	95.6	400,741	90.9	299,751	57.7	7,589,722	92.9	1,713,256	4.43
June	5,954,619	85.3	349,196	81.8	194,386	38.6	6,498,201	82.2	1,514,732	4.29
2nd qtr.	19,859,460	93.8	1,154,032	89.1	859,707	56.4	21,873,199	91.2	1,681,260	13.01
1st 6 mos.	41,254,823	98.0	2,372,458	92.1	2,298,064	75.8	45,925,345	96.3	1,775,236	25.87
*July	5,307,471	73.8	300,236	68.2	171,415	33.1	5,779,122	70.9	1,307,494	4.42
*Aug.	6,101,500	84.7	355,335	80.6	257,910	49.7	6,714,745	82.2	1,515,744	4.43
†Sept.	5,978,592	85.9	350,356	82.2	243,336	48.5	6,572,284	83.3	1,535,580	4.28
†3rd qtr.	17,387,563	81.4	1,005,927	77.0	672,661	43.7	19,066,151	78.8	1,452,106	13.13
†9 mos.	58,642,386	92.4	3,378,385	87.0	2,970,725	65.0	64,991,496	90.4	1,666,449	39.00

* Revised. † Preliminary figures subject to revision.

For 1949, percentages of capacity operated are calculated on weekly capacities of 1,626,717 net tons open hearth, 99,559 net tons bessemer and 117,240 net tons electric ingots and steel for castings, total 1,843,516 net tons; based on annual capacities as of Jan. 1, 1949, as follows: Open hearth 84,817,040 net tons, bessemer 5,191,000 net tons, electric 6,112,890 net tons, total 96,120,930.

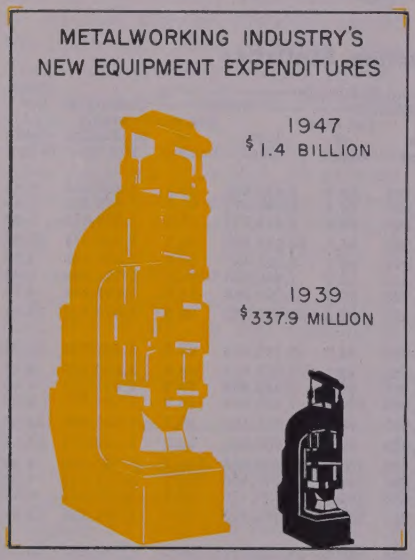
Capital Expenditures Up

For metalworking industry in 1947, total $2375 million, says Census Bureau

METALWORKING industry's expenditures for plant and equipment during 1947 totaled $2375 million, says the Bureau of Census.

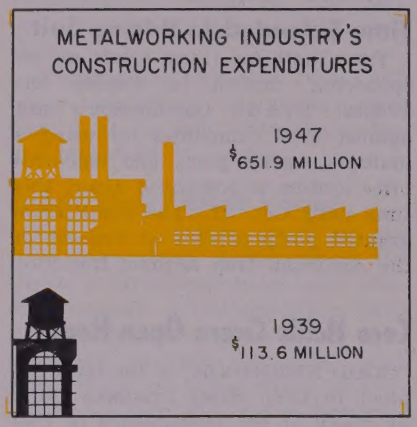
Of this sum, $651.9 million or 27.5 per cent was invested in new construction, $1,418,300,000 or 59.7 per cent in new machinery and equipment and $304.7 million or 12.8 per cent in used plants, used equipment and land. The complete breakdown of the six metalworking classifications in the accompanying table shows that primary metal industries spent the most in 1947, manufacturers of instruments and related products the least. Although primary metal expenditures were the highest, this category's employment is exceeded by two other groups—machinery, except electrical, and transportation equipment.

The metalworking industry's total expenditures for new machinery and equipment in 1947 were 419 per cent of that allotted in 1939, as shown:



Of the metalworking groups, electrical machinery makers spent nearly six times as much on new machinery and equipment in 1947 as in 1939. Transportation equipment manufacturers spent only three times as much in 1947 as in 1939.

The metalworking industry's expenditures for new construction in 1947 were 5.73 times those of 1939, as the chart indicates.



Among the metalworking groups, electrical machinery producers allotted 12 times as much for new construction in 1947 as in 1939. Instrument makers spent only three times as much.

There were marked variations in the 1939-1947 increase in capital expenditures among the various geographic regions. For the highly industrialized New England, Middle Atlantic and East North Central areas, the increases averaged only 335 per cent, compared with the national average of over 380 per cent. For the South Atlantic and East South Central regions, the percentage increase in expenditures approached 400 per cent. In the West gains were from 500 to 580 per cent.

Tunnel Nears Completion

WORK on the two-mile tunnel connecting loading docks on the Monongahela river with the new Weirton mine near Morgantown, W. Va., is entering the final stage. The mine will produce coal for metallurgical use by Weirton Steel Co., National Steel Corp. subsidiary, starting in 1950.

Boring operations on the tu were started last March by two c working toward each other from posite ends. The break throug complete and work will begin on installation of the belt conv for coal haulage and a parallel car track for maintenance and spection of conveyor tunnel and delivery of maintenance supplie river docks.

Conveyor will be a single unit 000 feet in length from head to pulleys. It will be driven by 200-hp electric motor with no i mediate drive or transfers. Spec designed conveyor belt will b inches wide, of steel cord cons tion.

Domestic Tool Orders Up

IMPROVEMENT in domestic o for machine tools in September greater than the decline in fo orders and caused the new order dex of the National Machine Builders' Association to advanc 57.7 from 51.5 in August. The eign orders index dipped to 13 September from 18.8 a month e and established a new low for year. Foreign currency devalua were a big factor in the declin

September shipments advan fractionally to 67.6 from 67.3 in gust. Ratio of unfilled orders to ments was 3.7 to 1, compared 3.8 to 1 a month earlier.

Association's indexes are base average monthly shipments in 19 1947 equaling 100. Average a shipments in the base period $355 million.

High Speed Tube Welder Sh

PRODUCTION steel tube weldi a rate of 200 ft per minut achieved with a high frequenc duction process developed by Crankshaft Co. and Yoder Co., Cleveland concerns. Developed 18 months of co-operative res the process had its first showi the National Metal Show.

Ohio Crankshaft developed heat application and Yoder w out the mechanical system of ing tubing. Metal is fused at peratures between 2300 and 26 with only $\frac{3}{16}$-inch of metal on side being subjected to 10,000 heating.

First production model is exp to be in operation in January. rently the system will work only low carbon steel tubing. It will tually be applied to nonferrous als and stainless steel.

Metalworking's 1947 Plant, Equipment Expenditures

Dollar figures in millions.

	Primary Metals Indus.	Fabricated Products	Mach'y except Elec.	Elec. Machinery	Transportation Equip.	Instruments, etc.
Total expenditures for new plant and equipment	592.2	304.8	517.6	244.6	355.0	56.0
New construction total	212.7	92.1	167.4	64.9	99.5	15.3
Buildings	126.4	82.5	153.5	58.6	87.0	14.6
Other	86.3	9.6	13.9	6.3	12.5	0.7
New mach'y-equip. total	379.5	212.7	350.2	179.7	255.5	40.7
Production	351.2	189.0	306.8	155.8	222.1	34.9
Other equipment	28.3	23.7	43.4	23.9	33.3	5.8
Used plant, equipment, land	77.7	27.5	80.7	31.5	77.6	9.7
TOTAL EXPENDITURES	669.9	332.4	598.3	276.1	432.6	65.7

Way To Cut Costs

tandardization offers almost limited field in which to effect economies

KING for ways to cut costs? ok then at the possibilities that ardization may hold for you. field is almost unlimited. This emphasized at the 31st annual ing of American Standards As- tion in New York.

ether the standardization be in rials or methods the aim is the —avoidance of the cost of dup- on.

e Problem—Focusing attention is point, V. de P. Goubeau, vice dent in charge of the materials rtment, RCA Victor Division, Corp. of America, exclaimed: many companies are struggling an unwarranted variety of sim- products; warehouses loaded with , jigs and fixtures instead of ; staffs handling personnel and and knockdown personnel ding more time on production ment than the production op- rs themselves; customers yell- or delivery and better prices!"

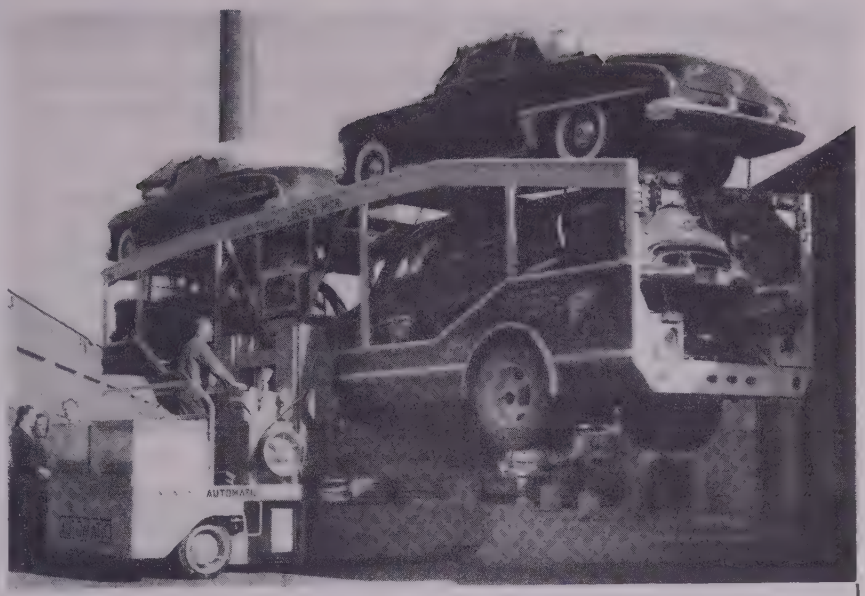
stly Duplication—Drawing on his of work—procurement—for an ple, Mr. Goubeau says that one where standards have paid off somely to both manufacturer and is in the use of a "preferred s" practice. "With the rapid ad- ement in electronics, tube types ided. In tube manufacturing, problem of serving all customers, with small quantity require- s of a large number of different s, became untenable," he points As a result "too great a vari- f raw materials had to be pro- , each in small uneconomical tities; too much factory space required for a vast collection of ties; too much time and expense involved in setups for short "

w for the solution: "From the , a careful selected small list preferred types' was developed," Goubeau explains. "We can now facture more efficiently for cus- rs' schedules and for stock. Our duction rate on preferred types ore uniform because of long runs smaller demand for other types. er types mean better delivery and e uninterrupted production of ronic equipment in customers' ts."

es Big Opportunities—From this other experience with the ap- tion of standards Mr. Goubeau nvinced the full use of all applic- standards may go a long way to- s the assurance of an acceptable product at a competitive price.

Indicative of the broad field in which standards can be applied is the report on plant construction standardization by W. H. Kiler, Standards Section, E. I. du Pont de Nemours & Co. Inc. "Postwar, with rising construction costs and the shifts from a buyers' to a sellers' market and now back again, the importance of standardization to industrial construction becomes increasingly important as a means to make it possible to purchase a better product at lower cost," Mr. Kiler asserts.

"Probably specification writing pays the greatest return for the effort expended. Standard specifications with which suppliers and construction contractors can become familiar will reduce costs," he believes.



MERE 15 TONS: This industrial truck made by Automatic Transportation Co., Chicago, is capable of handling loads up to 110,000 pounds. Demonstration load of a highway trailer loaded with four Oldsmobiles is a small job for the electric truck. Oldsmobile Division of GM will use it to handle huge automotive dies

Too Much California Crude Oil

SUPPLIERS of pipe, tanks, and equipment to California's petroleum industry are as concerned as oilmen themselves over authoritative warnings that the industry in this state is seriously overproducing crude oil.

How severely this overproduction and subsequent cutbacks may affect the steel and metalworking industries cannot yet be predicted, but there will be definite repercussions, for makers of oil country goods comprise one of California's largest industries.

Standard Oil Warns—Latest warning against the critical implications of continued heavy unbalance between supply and demand was sounded by T. S. Petersen, president of Standard Oil Co. of California. He pointed out that the unsold accumulation of more than 24 million barrels of crude since the start of 1949 has placed an unwieldy stock burden on oil companies of all sizes.

As a result of overproduction, he said, inventories in Pacific Coast petroleum areas increased during the first quarter at the rate of 35,000 barrels daily, in the second quarter at the rate of 135,000 barrels daily, and during July and August at the rate of 144,000 barrels daily.

Causes of Over-Supply—"Over-supply has been caused by a combination of circumstances," Mr. Petersen said. "Accelerated development to meet immediate postwar demand created a high production level. But demand this year has been curtailed by reduced export and military requirements, decreased maritime activity, dieselization of railroads, and large imports of natural gas. The problem first made itself felt in surpluses of heavy fuel oil, but excess output is now increasingly apparent in lighter products as well."

Although it is the second largest oil producing state, California has no petroleum conservation law. In another important petroleum area, Texas, production is controlled and has been cut back. While output has been reduced in some California fields, total production for the state has remained considerably above requirements.

Lab-Shop Teamwork Seen at Metal Show

Cleveland exposition demonstrates that America's dominant industrial position is supported by close partnership between science and working practice

OUTSTANDING impression gained from the 1949 Metal Congress & Exposition is that America holds its dominant position in the industrial world because a close working partnership exists between science and practical ingenuity. This was proved by numerous instruments, machines and other equipment on display, wherein basic principles not long out of the research laboratory now are practical working tools involved in the constant drive for economy in production.

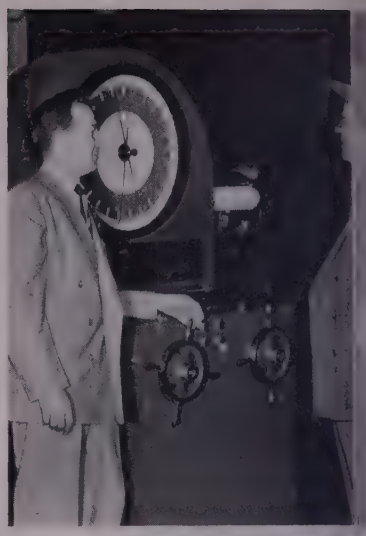
Anyone who questions the propriety of science penetrating into the shop should recall that less than 25 years ago gas and electric welding —and their companion technique, flame cutting—were considered by more conservative industrialists to be of doubtful practical value. Many a Doubting Thomas has lived to see gas and electric welding bring about a veritable revolution in the design and construction of metal products ranging all the way from small drilling jigs to huge drilling rigs.

Technological Advance Held Essential—Industrialists today are inclined to be far less skeptical of scientific innovations for two reasons: They have been mentally conditioned by such revolutions in shop practice to realize that many other swift and sweeping changes are possible and probable at any moment; having seen the effect of technological changes in the recent past, they want to be sure that changes sweep them ahead, but not over the dam.

The 1949 Metal Show emphasized above everything else that economy in production depends largely on elimination of wasted materials and wasted time. The number of exhibitors who demonstrated ways and means of getting metal into manufactured parts instead of into the scrap bin was particularly impressive. In the realm of metal conservation can be classed the displays of parts produced by forging, stamping, extruding, die and other precision casting processes and from tubing and rolled shapes; of machines for producing, heat treating, finishing and fabricating such parts and materials; and of finished assemblies made up of such parts.

Industry Must Keep Up with Times—Repercussions of new inventions, the use of unusual materials, new methods of heat treating reach further into the vitals of industry today than they ever did in the past. The rapidly growing use of pressed metal nuts and related fastenings, for instance, has put punch presses into direct competition with screw machines, upsetting machines and threading machines. At the same time it has put strip steel into direct competition with rods, bars and coiled solid stock. Smart industrialists at the show were giving serious thought to means for meeting such eventualities—either by finding new uses for their materials and machines or by swinging over to other forms of materials and other types of machines in tune with the times.

Mechanization Is Byword—The extent to which non-destructive test-

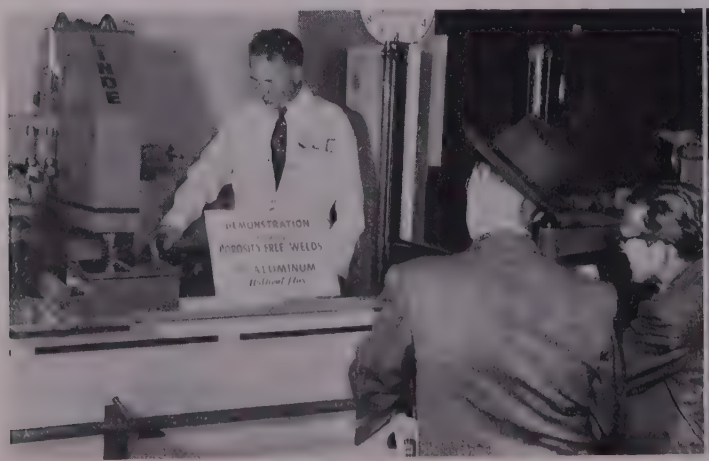


Attraction: Tensile testing

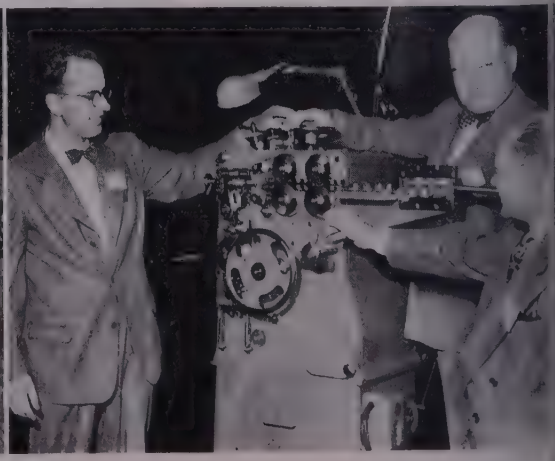
ing machines, flame hardening chines, induction hardening mach polishing machines and cleaning chines have been mechanized is of the great signs of the times. tures on this page taken by ST photographer show some of typical cost-saving, production proving machines on display at exhibition.

For some reason American genuity excels when it comes to signing built-in work holding conveying devices and in tying t in with the machining or heatin other process through time cycle trol. The conclusion to be dr is that labor costs have reached point where the machine which l itself, carries through its funct automatically, and unloads itsel one of the prime answers to problem of holding the line on duction costs. Not so long ago was true only in big lot produc Today it holds for medium and s lots.

Aid to quality control: Porosity-free welding



Spring forming machine—they find it versatile



w Are You Cutting Costs? Executives at Metal Show Give You Their Answers

SPREAD interest in cost sav- sent STEEL's editors to the Congress & Exposition to ask: are you doing to cut costs? s what representative company tives have to say.

m B. Given Jr., president, **ican Brake Shoe Co.,** New York: mid-1948, we have been at- ing to raise our "per unit" out- y educating our employees. This ing done in all our 58 plants gh the foremen's instilling team in those under him.

have the mechanized end of facturing to a point where costs held to a minimum. Further utting to meet competition can only through personnel who feel are on the team.

r method of attaining this goal a an information center which oremen will attend. These men and talk with all officials and iven frank answers to questions.

m Adam Jr., vice president, **Electric Co.,** Philadelphia: We it a practice to look over care- anything in the line of equip- that may serve our purposes. re constantly on the lookout for ing that reduces overhead.

furnace business is still a cus- operation. We have a high over- in form of trained personnel— nnel that cannot be discarded sales drop. Therefore as fur- sales decrease cost of manufac- increases. This March we moved a new plant which consolidated tions. In one bay, we expedit- erations with a handling sys- hat uses either a 5, 10 or 15-ton in moving materials over an r railroad siding.

. Miller, president, **Miller Elec- lfg. Co.,** Appleton, Wis.: An in- ve program and good employer- oyee relations are our means of ng production costs down.

r employees are kept closely in- d of the company's affairs. Re- Employees and employer trust other.

atisfied worker is a better work- A better worker gives higher ction. Under an incentive plan igher output means more take- pay for the employee and low- its costs for the company.

Turpin, chief engineer, **Hauck Co.,** Brooklyn, N. Y.: Better g, better production scheduling, ved storage and handling equip- afford us our major cost-sav- pportunities. Reduced pressure roduction is really a Godsend the cost standpoint. Only now have we the time needed to study cost-saving possibilities and to experiment with them. This study and experimentation has enabled us to move a machine here, modify a process there in dozens of small ways which add up to surprisingly large savings.

A. F. Jackson, executive vice president, **Lake City Malleable Co.,** Cleveland: Daily supervision of costs and budgets is one major method of cutting our costs. We find it essential to work with our men to educate them in productivity, control of waste and general efficiency.

J. J. Whitenhafer, Columbus Division manager, **Lake City:** Another important way we cut costs is through redesign of our product, by reducing its weight, by increasing strength through structural changes and other means.

A. Bollerman, president, **Pyrometer Instrument Co. Inc.,** Bergenfield, N. J.: We are in an enviable position because our production methods are as efficient as we can make them.

Despite higher operating costs, including doubled salaries, we as an instrument company have been able to maintain prewar prices.

We have done this by taking advantage of modern techniques. We had our costs scaled down to the bone before the war. Then through increased production realized by assembly-line procedures we offset labor costs.

Norman C. Bloye, vice president, **Hevi Duty Electric Co.,** Milwaukee: In producing furnaces, we are eliminating hand labor wherever we can. We are doing this by redesigning our products and getting as many components as possible on a repetitive basis.

Here's how: We found we could cut costs by getting away from square shaped furnaces. We discovered that by literally cutting corners from some of our laboratory type furnaces, we also could cut production costs—not to mention savings in heating efficiency.

We also are making many interchangeable parts.

L. V. Nagle, vice president, **Udylite Corp.,** Detroit: One thing we have done is to set up an organization-wide budget control system. Besides heads of departments in the plant including foremen, the setup encompasses all branch offices.

By making our people cost conscious through budget control we have been able to make savings that even benefited our customers — savings that range from 5 to 10 per cent. Operating costs also have been lowered through standardization.

We also were successful in finding new lower cost materials for plating barrels. Not only have these materials provided superior performances, but they have enabled us to pass on a 20 per cent savings to customers.

H. A. Stearns, manager of industrial instrument sales, **Brush Development Co.,** Cleveland: Our manufacturing costs are coming down because our production is increasing. A switch to die casting a cabinet, for instance, has meant substantial cost reductions. We have learned, too, that savings can be realized by subcontracting some of our work.

Mrs. Florence M. Sayle, president, **Cleveland Punch & Shear Works Co.,** Cleveland: Any improvement to metalworking machinery which makes it easier and safer to operate helps users cut costs. One of our contributions is a clutch-brake unit, now standard equipment on new presses and applicable to machines in the field.

This drum-type unit gives instantaneous stopping and starting, and exact "inching" at the touch of a button. If air pressure falls or electric current fails, the clutch lets go and the brake stops the press.

Leighton A. Wilkie, chairman of the board, **Do-All Co.,** Des Plaines, Ill.: Economists believe that an 8 per cent improvement in productivity of American industry will bring about the much discussed era of plenty-for-all by 1960.

Simplification of design and use of our own contour sawing machines for cutting frame details for welded construction are among the many things which keep the cost of our machines at a level where users can afford them.

No Cure for Corns

YOU walked two miles if you just glanced at the 375 exhibits at the Metal Show. How long did it take? About two hours if you walked casually and didn't stop to look closely at the $6 million worth of new machinery and equipment, a full working day if you had really wanted to "do the show." The displays were spread over five and a half acres. An estimated 60,000 persons viewed them.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor,*

Growing awareness of keeping the nation's shipbuilding industry alive by encouraging new construction is indicated. Joint Chiefs of Staff herald importance to national defense

AMERICAN shipbuilding may get some encouragement next year.

Although shipyards were rebuffed when House-Senate conferees killed an appropriation of $25 million to repair 134 ships in the Maritime Commission's mothball fleet—as start of a program to repair 439 merchant vessels—the program is being pushed by the Joint Chiefs of Staff. They say it is necessary for the national defense. There is increasing recognition in Congress of the need for keeping the industry alive, a growing awareness that construction of ships needs encouragement.

Obsolete Ships—This is the theme of a report filed by a Senate subcommittee. It points out that the war-built merchant fleet is becoming obsolete and "a replacement program of new ship construction may be in order." The report points up increasing foreign competition since the war. Foreign shipyards are enjoying a boom, particularly those of the United Kingdom and Sweden. Shipbuilding and ship repair in this country "is again in the doldrums," says the report, and a planned program for repairing vessels in the reserve fleet is imperative.

Shipbuilding and ship repair will come up for legislation next year, the former when the Bland omnibus bill is taken up. As reported Oct. 11 by the House Merchant Marine and Fisheries Committee after a nine-month study, it would amend the Merchant Marine Act of 1936 by applying the construction-differential subsidy to all vessels operated in United States foreign commerce, not only to vessels plying in designated trade routes with operating subsidy assistance.

Liability Shift—An important provision of the Bland bill called for by the shipping industry is that which limits liability on new ships: When an operator purchased a ship under the construction-differential subsidy contract, the government would take a first mortgage; liability of the operator would be limited to that first mortgage, and there would be no proceeding to collect against his other assets. Ships purchased under the Bland bill would be of Navy-approved design and eligible for subsidies in consideration of national defense features such as speed. Operators would benefit from tax incentives provided in the bill. As amended by the committee, the Bland bill would provide government assistance for modernization of vessels in the Great Lakes and St. Lawrence waterway.

Cold-Worked Steel Investigated

ORDNANCE Department's investigation of cold-worked steels has been broadened considerably since it was launched in 1947. Results, when available, will be of vital interest to steel consumers—particularly designers of steel products.

Here's the object in a nut shell: To determine the extent to which cold-worked steels may be used as substitutes for high-alloy steels or steels which must be heat-treated.

If cold-worked steel proves to have hoped-for characteristics, there should be a saving in machining time and equipment through cold drawing or cold extruding steel to final shape and finish dimensions.

Testing Phase Now Covers Bars, Tubes — Test data being compiled cover: Effects of cold working on significant properties and characteristics, effects of sub-zero temperatures, aging, and other factors on strength, ductility, impact resistance and endurance of cold-worked steels. The present phase involves bars and tubes. Bars are supplied by Union Drawn Steel Division, Republic Steel Corp., and tubes by Babcock & Wilcox Co., Beaver Falls, Pa. Bars are of four compositions — SAE 1016, 1040, 4615 and 4640. Tubes are of two compositions — 1040 and 8630. The bars are cold drawn with total reductions ranging from 6 to 80 per cent without any intermediate heat treatment. Tubes are drawn to total reductions of 10 to 65 per cent.

Tests are being conducted by the Case Institute of Technology. Results are being studied by the Watertown Arsenal laboratory staff. Results will be correlated with those obtained from the Ordnance Department's recently completed basic study on cold-extruded steels. The arsenal laboratory staff plans to begin preparation next year of a manual covering possibilities and limitations in the use of cold-drawn, cold-rolled and cold-extruded steels, and indicating precautions to be observed in their ... The manual is to be distrib among ordnance designers.

Hearings on Monopoly Proble

PHASES of the monopoly prob to be addressed by the Celler committee of the House Judici Committee when it resumes hear on Oct. 25, are:

Should fines for criminal violat of antitrust laws be increased legislation on jail sentences de able? Should procedure on triple d ages be simplified? Should gov ment be allowed to sue for dam to itself? Should damages be than triple at court's discretion? antitrust laws be made less cum some? In what ways are patent l inconsistent with antitrust laws procurement policy legislation ne to protect small producers? W features of tax laws and regulat are inconsistent with antitrust cies? Can tax laws be made to as inducement to limit or reduce centration? Are results of the R Bulwinkle Act compatible with intent of Congress? Does the W Pomerene Act unfavorably affect ternal free enterprise?

Among invited witnesses are eral "prominent" business leader

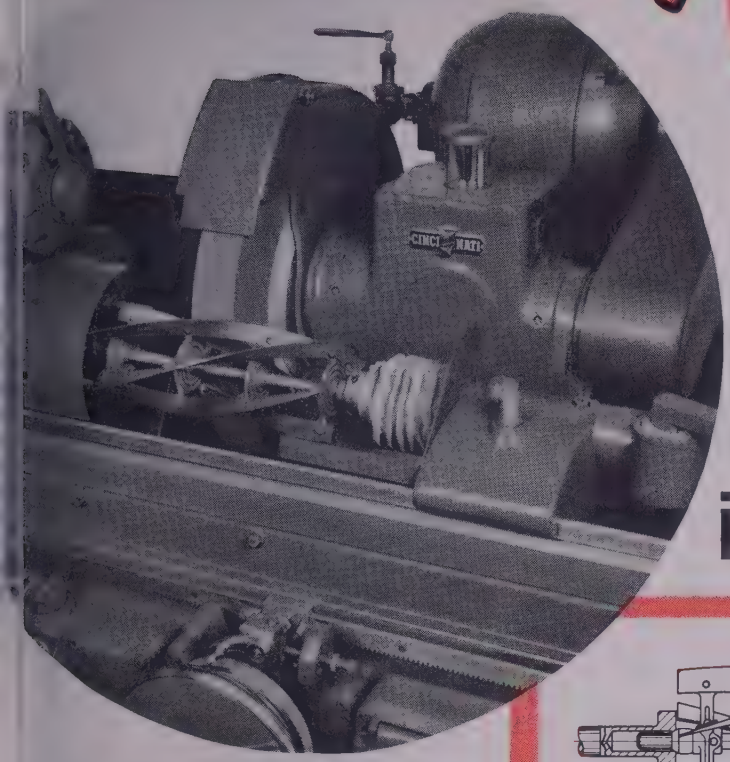
FCC Clinic on Radio Interfere

METALWORKING industries h expressed little interest in a con ence expected to lead to eventual design of much electrical equipm

So far only two large compa have signified their intentions of ing represented at a conference t held by the Federal Communicat Commission Nov. 1. This indiffe attitude arouses surprise because meeting will serve as a clinic for cussion of radio interference f all electrical equipment not yet ered by FCC regulations. The n ber of devices in question runs the thousands. They include elec motors, switches, toasters, wash machines, elevators, electric induc heating equipment, welding appar —to mention only a few. One c pany alone makes 150 different p ucts to be considered.

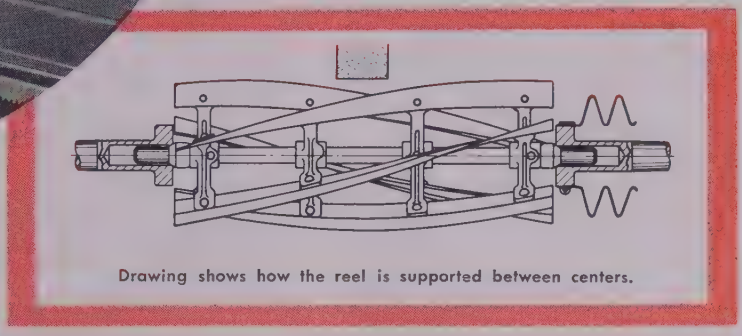
"It is not proposed to throw of these manufacturers out of b ness," a commission staff mem told STEEL. "But a real problem present due to rapidly increasing gestion in the usable radio freque spectrum. New radio uses are veloping rapidly—so that it beco

-ZING

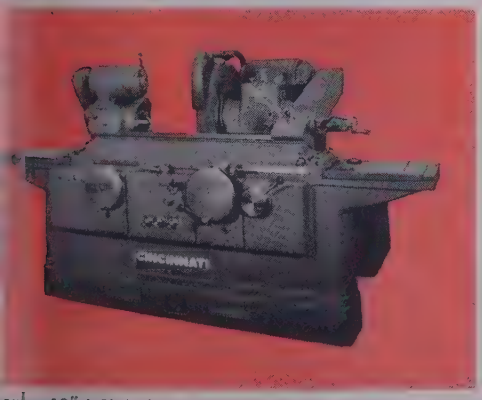


and another lawn mower reel is finished ground

Several sizes of lawn mower reels are ground on this CINCINNATI 10"-L x 30" Plain Hydraulic Grinding Machine. The footstock has 3⅞" spindle retraction for the purpose of supporting the reel on its bearing cones, between female centers. Production varies up to 75 per hour, removing .010" for the finish grinding operation.



Drawing shows how the reel is supported between centers.



CINNATI 10"-L Plain Hydraulic Grinding Machine. Complete specifications may be obtained by writing for catalog G-566.

Take a tip from lawn mower people when selecting a machine for light cylindrical grinding operations. Choose the required machine size, say 10", which has the power and mass rating of the next smaller size. Then you will have sufficient power at the grinding wheel plus extra swing over the table for the largest diameter of the part. That's the formula used by lawn mower manufacturers in selecting CINCINNATI FILMATIC 10"-L Plain Hydraulics for the cylindrical grinding operation illustrated here. But the things that really counted most in their selection were Cincinnati's dependable low cost performance, rapid production, and efficient, reliable service organization. ¶ FILMATIC spindle bearings—an exclusive Cincinnati feature—and automatic filtered lubrication are big factors of dependability in these machines. Unit type construction keeps down maintenance expense. Other features are described in an attractive catalog. Write for a copy.

CINCINNATI GRINDERS INCORPORATED

CINCINNATI 9, OHIO, U. S. A.

CENTER TYPE GRINDING MACHINES • CENTERLESS LAPPING MACHINES • CENTERLESS GRINDING MACHINES

imperative to keep interference in all wave bands at a minimum.

"It is clear that as time goes on the commission may be forced to set maximum interference standards for all these different types of apparatus which come under the head of 'incidental radiation devices.' An ultimate effect may be the redesign of many present electrical products to achieve a realistic balance between the interference potential of such devices to authorized radio services, on the one hand, and practicality of design on the other."

At this meeting an attempt will be made to lay the groundwork for setting up a standard to measure radio interference from these incidental sources. The commission intends to build future rules around such a measuring standard.

Large Metalworking Market

LARGE NEW market on the verge of being opened to the metalworking industries is through mechanization of the cotton industry.

This goal, Department of Agriculture engineers say, is a step nearer as a result of research work in 15 southern states under the Research and Marketing Act of 1946. Aim is complete mechanization of all phases, from disposal of crop residue, through preparation of the seedbed and control of weeds to stripping and picking, storage and ginning.

About 3000 spindle-type cotton pickers now are in use, compared with several hundred shortly after World War II, and their advantageous operation is under intensive study. The campaign, which has active co-operation of farm machinery, cotton gin and other manufacturers, calls also for complete mechanization of crops normally planted in rotation with cotton.

Labor Lament: 81st Congress

LABOR has a long list of congressional incumbents it will try to unseat next year.

Why? From labor's point of view, the record of the 81st Congress to date is not much better than that of the 80th Congress. The only favor they have received from this Congress is the increase in the minimum wage from 40 to 75 cents an hour.

Biggest blow to labor, of course, was the refusal of this Congress to repeal the hated Taft-Hartley Act. Since then labor has received one blow after another. Latest is the elimination from the Military Appropriations bill of the time-study ban. This was to have extended the ban from the Navy to the Army and Air Force. Now the Navy, for the first time in many years, is in a position to use stop watches and conduct time studies in its shore establishments.

Another blow was the Senate refusal to confirm reappointment of Leland Olds as a member of the Federal Power Commission. Still another was failure of both houses to act on the eagerly sought federal-aid-to-labor-education program. Both houses failed to authorize grants to the states to foster safe working conditions.

Streamlining of Withholding Tax System

PLANS for streamlining and improving collection of income tax wit held from wages of employees and taxes due under the Federal I surance Contributions Act are underway.

Final regulations will not be issued until late this month so i terested persons may have a chance to make comments or suggestio The revised procedure is expected to take effect Jan. 1, 1950, sa George J. Schoeneman, commissioner of internal revenue. He sa the plan is expected to effect savings to employers generally. Pr posed changes are expected to save the Treasury Department well ov $1 million in interest costs and substantial additional clerical co in handling documents.

Here's how the plan is to work:

1. Combined Return Form—A new combined form (941) will be us in place of Form W-1 used for reporting income taxes withheld fro wages and Form SS-1a used for reporting taxes due under the FIC The combined form will cut in half the number of returns filled employers and handled by collectors' offices. It permits employe to pay both taxes with one check, if desired.

2. Deposit of FICA Taxes—Employers using the system of maki monthly deposits of income tax withheld from wages, then using t depository receipts instead of cash in making payments on quarter returns, may use the same system for employer and employee tax due under FICA.

3. Federal Reserve Depositaries—Deposits will be made in the Federal Reserve Banks, but employers may give their tax deposits authorized commercial banks for forwarding if they want to.

4. New Depositary Form—To insure accuracy and simplicity crediting employers with tax deposits, a new blank, Form 450, will given to employers making deposits. These forms will be okayed Federal Reserve Banks when they receive the deposits. Validat receipts will be sent to employers for attachment to their quarterly r turns on Form 941.

Employers who are liable for more than $100 of income tax wit held from wages and FICA taxes per month will be required to d posit these taxes by the 15th day of the next month after the first a second month of each quarter of the calendar year. Here's an exampl You should deposit your January tax by Feb. 15, your February t by Mar. 15.

You may deposit tax for the third month in the quarter any tim in the next month. This means you may deposit March tax any tim in April. You should remember though that the deposits should be ma early enough so a validated receipt will be available for filing wi the quarterly return.

Reciprocal Trade Agreements

RECIPROCAL trade agreements program will continue to be administered much as before under the new Trade Agreements Extension Act with one exception: A tariff commission member or alternate will serve as man of the Committee on Recip Information.

This is a group of special in to business and industry: Its tion is to receive, digest, and late to the entire trade-agree organization the views of inte persons regarding any phase of posed or existing trade agreen

The entire program will be a istered by the Interdepartm Committee on Trade Agreen chairmaned by a State Depar representative. Trade agreement continue to be negotiated by Trade Agreements Committee.

A new executive order by the ident says each future agreeme conformity with past practice, contain a most-favored-nation mitment.

U. S. Strikes May Aid Western Europe

German and Belgian steel producers are operating below capacity, could supply American consumers. British and French output could be diverted for coveted dollars

AMERICA'S labor difficulties may provide a temporary boon to Western Europe.

German and Belgian steel producers believe there is a good chance to sell to the U. S. if the steel strike lasts much longer. Production in both these countries is slipping because of sagging demand. Domestic and foreign consumers are still keeping British and French output high, but some tonnage could be diverted to the U. S. for coveted dollars.

Then or if the steel strike has widespread effects on American consuming industries—notably automotive—Europeans think there may be a call for their products. This optimism nourished optimism at the French auto show which opened this month in Paris.

Ruhr Steel Output Drops

Steel ingot production in Western Germany declined sharply from 917,000 net tons in August to 835,791 in last month. Daily output declined 5.4 per cent. New orders have been fewer; for the past few months the industry has been producing into stockpile. Now steelmen are producing out 30 to 40 per cent more than they can sell—hence, the interest in American markets.

The heaviest order declines are in railway materials, structurals and forgings. Further reductions are imminent and workers are being furloughed. The general credit pinch is considered responsible for this slump. Domestic steel consumers haven't the money to finance purchases. In other markets foreign competitors have the advantage because the Ruhr's steel plant is now remodeled.

Reflecting the crisis in steel is the recession in scrap markets. Monthly scrap collections amount to 500,000 tons but steel plants use only 250,000. A price reduction—quotations are government-controlled—in scrap to $32.38 per ton is being resisted. The trade in Western Germany suffers from overexpansion, the only industry in the entire economy which has such a malady. Many scrap dealers are in favor of a cartel.

Unchanged are economic conditions from just a year ago that all steel allocations can be lifted Jan. 1. A completely free market will also be restored to the coal industry. Ruhr export coal prices remain the same, at 52 marks per ton, in spite of devaluation of the mark. This is in accordance with demands from France which relies on German coal and had agreed to devaluation only if coal prices remained the same in marks. This means a reduction of the dollar price of exported coal from $16 to $12.50 per ton, at least for German shipments to France. The domestic coal price in marks remains the same at 42, or about $10 per ton.

U. K. Production Up

Production of steel in Great Britain edges upward. Some tonnage could be diverted to American consumers.

Output of steel ingots and steel for castings in September was at an annual rate of 17,815,000 tons, compared with a rate of 16,747,000 tons in August and 17,287,000 tons in September, 1948. Pig iron production was at an annual rate of 10,790,000 tons, compared with a rate of 10,602,000 tons in August and 10,536,000 in September, 1948.

French Automakers Eye U. S.

Renault and other French automakers plan to strengthen their position in the American auto market just in case the steel strike cripples Detroit.

This was evidenced at the 36th Paris auto show which opened early this month. More than 1200 manufacturers are taking part, compared with 1000 last year. Attracting much attention at the exposition is a small Renault designed to sell cheaply in the U. S. Another midget is the 2 hp Citroen selling for $650. It can attain a speed of 50 miles per hour and can travel 60 miles on a gallon of gasoline. French producers also display deluxe vehicles, notably Satutchick & Co.'s Delahay selling for $14,300.

Forty-one French exhibitors are showing 18 auto models and 96 types of trucks. In 1938, 66 auto models and 96 truck types were on display. The U. S. has the largest number of foreign models; 18 are shown by General Motors, Chrysler, Ford, Packard, Hudson, Willys-Overland, Studebaker, Nash and Kaiser-Frazer. Other foreign exhibits come from nine British firms, three Italian, three Czechoslovak and one German.

France holds third place in world production of commercial vehicles and fourth in output of autos, Russia not included. It makes one vehicle to every two of Great Britain and 21 of the U. S. Canada is just ahead of France in auto manufacture.

French auto production is now 22 per cent above that of 1938 and 5 per cent ahead of the record 1929. Output is approaching 300,000 units a year, but the Monnet plan estimates that 400,000 can be turned out in 1950 and 500,000 in 1951 and 1952. More than 90 per cent of the production is done by five firms; the other 28 make less than 25,000 autos a year.

Renault produced 65,800 in 1948, Citroen 42,800; Pugeot 33,600; Sincà 18,200 and Matford 14,900. Auto exports are mounting—54,800 went overseas during the first half of this year, compared with 73,200 for all of 1948.

ECA funds totaling $16,535,500 will be used by Electricite de France, the government-owned power company, to purchase miscellaneous equipment and spare parts in the U. S. for the interconnected French power system. ECA has also approved a project for construction of a thermal electric power plant of 100,000 kw capacity at Dechy, France. The plant will be operated by Charbonnages de France which controls the French coal industry. Cost of the project includes $15 million in ECA funds and the local currency of $4.5 million to be supplied by the French government.

Linz Steel Plant Remodeled

A steel plant which Adolph Hitler started at Linz, Austria, near his birthplace, to supply the armor plants of the Third Reich is being

Opportune Time?

ELEVEN British trade unionists are coming to America to see how U. S. unions operate. They seek knowledge on how trade unionists here are trained in techniques of management, wage systems and job evaluation.

They will visit many U. S. industrial centers and will discuss their problems with officials and technicians of the AFL, CIO and unaffiliated groups. During the six weeks the British representatives are here, they will also study the work of engineering and research departments of American unions which have been helpful in increasing industrial productivity. All eleven visitors were selected by the British Trades Union Council.

cut back to size and adapted with Marshall Plan aid to the uses of peace.

Hitler and Hermann Goering had planned to erect 12 blast furnaces with a capacity of more than 2 million tons of pig iron a year. Six furnaces were completed, but of these only three are necessary to serve Austria's domestic and export needs, in addition to other domestic steel facilities. Three other furnaces will be sold, one probably to Sweden. Besides the blast furnaces, the steel plant now has two 200-ton open hearths, a plate mill and a small sheet mill. ECA is helping to build a slabbing mill and a hot strip mill. A cold rolling mill may be added later.

When the Linz plant is in full production, it will turn out 500,000 tons of steel a year, accounting for two-thirds of Austria's steel production. The plant was designed before the war by H. A. Brassert & Co., New York.

JAMES W. ZUBER

RUSSELL C. JAENKE

Russell C. Jaenke, advertising manager of STEEL since 1941, ha been appointed director of advertising of the Penton Publishing C James W. Zuber becomes business manager of STEEL.

Mr. Jaenke joined the company in 1926 as an advertising salesma on STEEL, serving successively as territory manager and as advertisin manager. His new duties as director of advertising for the compan will encompass advertising activities of all Penton publications. M Jaenke was elected a vice president of Penton in 1944.

Mr. Zuber joined Penton in 1933 as a STEEL circulation salesmar He later became advertising representative on STEEL in the easter territory, was made circulation manager in 1938 and since 1945 has bee director of circulation and research for Penton.

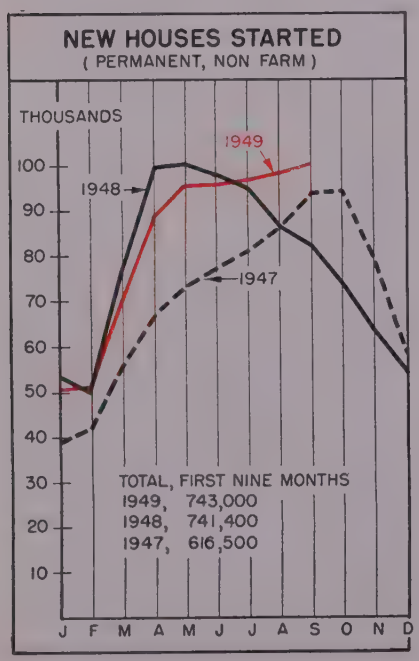
Robert L. Hartford has been made business manager of *Machin Design*. He joined STEEL'S editorial staff in 1936, later becomin Pittsburgh editor and Penton manager of market research.

Business Builder

Record number of new houses put under construction swells demand for metal products

DEMAND for products of the metalworking industry was swelled by the setting of a September record for number of new nonfarm houses started.

That month construction began on 100,000 new nonfarm units, the U. S. Bureau of Labor Statistics reports. It marked the first time that as many as 100,000 of such dwelling units were put under construction in September. By jumping from 98,000 in August the number for September constituted a marked contraseasonal move.



Construction of nonfarm dwellings has continued steadily upward, as shown in the accompanying chart, since the beginning of the year, with July, August and September at record levels. The Bureau's preliminary estimates show a 743,000-unit total for the first three quarters of 1949, surpassing last year's total for the first three quarters by 1600 units. Starts of nonfarm dwellings in September, 1948, were 82,200; in September, 1947, 93,800. The September, 1949 figure approximates that of May 1948, when the total was 100,300.

Feeling Steel Strike—Housing construction is beginning to be handicapped by the steelworkers' strike. Already the supply of some steel products, such as steel pipe, going into housing is exhausted in certain areas.

The September, 1949, starts require about 350,000 tons of products of the metalworking industry. Each six-room house takes about 3.5 tons of such products, the American Iron & Steel Institute says. The 1949 rate of usage of steel products in houses is equivalent to around 5.5 per of finished steel production. In the consumption of steel produc housing was less than half what now.

Major Uses—Today's six-house may take as much as pounds of steel lath. Another item is steel pipe for gas, water heating purposes, totaling about pounds. Radiant heating, if incl would add about 1.5 tons to tha tal of pipe.

Nails and miscellaneous wire count for about 600 pounds; gu and downspouts take approxim 475 pounds of steel; flashing miscellaneous sheets used for tective purposes may take pounds, while such steel hard as locks, knobs and hinges can count for 90 pounds of steel.

Steel Windows Increasing—C items include electrical steel con 140 pounds; heating system, 30 800 pounds; bathroom, 300 pou kitchen equipment, 800 pounds. windows are becoming popula many small dwellings. They w about 50 pounds each, and a six-r house may have 16 of them.

Other metal products—from s tural shapes to home applianc go into new homes.

lution Control Grows

ater sanitation laws get more tention from federal, state and unicipal governments

K for increasing municipal, state n federal pressure to control water ollution. Gathering momentum of n trend toward abatement will af- d metalworking because industrial s of river, harbor and lake waters s ne of the three major causes of ollution. The others are pub- ic sewage disposal and soil erosion. ederal Security Agency is ear- king $850,000 to states, terri- ries and the District of Columbia o study water pollution resulting rom industrial waste. A total of $2 million has been appropriated o the agency to initiate a nation- wide program of water pollution con- ol and prevention which Public Law No. 845, passed in June, 1948, mplates.

anitation Laws Widespread — N 41 states and the District of Columbia have laws against water pollution. Georgia, Idaho, Missouri, North Carolina, South Carolina, Utah and Wyoming have none. Laws go back as far as 1893, but many states —notably New York and California —ave just enacted voluminous stream sanitation codes. Since the w, 27 states have enacted or mended such legislation. There are 11 formal interstate antipollution compacts and a few informal agree- ments.

The largest of the regional pacts is administered by the Ohio River Valley Water Sanitation Commission which seeks to control contamination in the 200,000-square mile Ohio river drainage basin. Participating are Ohio, Indiana, West Virginia, New York, Illinois, Kentucky, Pennsylvania and Virginia.

Costs to Industry Vary—In some cases the expense can not yet be computed. In some areas contamination is caused principally by soil erosion and public sewage. The cost of cleaning up the boundary waters between the United States and Canada from Port Huron, Mich., to Toledo, O., has been estimated. International Joint Commission believes a $98 million expenditure must be made by U. S. and Canadian municipalities and industries: U. S. cities, $8 million; Canadian cities, $14 million; U. S. industry, $13 million; Canadian industry $3 million.

Bethlehem Pacific To Build

BETHLEHEM Pacific Coast Steel Corp. will shortly begin building its new structural steel fabricating plant on property in Seattle acquired from Isaacson Iron Works.

A structural shop 140 x 400 ft will be erected. It will be equipped with forming, punching and shearing facilities for fabrication of a wide range of steel frame structures. Shop layout will be designed to permit a straight-line flow from receiving to shipping. Plant facilities will include a new transmission tower fabricating shop 80 x 400 ft and a complete galvanizing plant 60 x 150 ft.

Coincidentally, Bethlehem Pacific is constructing new tower testing frames at its plant in South San Francisco—the only facility of its kind on the West Coast. Frames will have a capacity for testing transmission towers up to a height of 150 ft. This height provides for the largest voltage transmission towers now in use.

Taconite Production Cost

CAPITAL investment for a taconite beneficiation plant capable of producing 100 million tons of pelletized ore annually would be $1.5 billion, not $150 million as reported in STEEL (July 4, 1949, p. 39). The $1.5 billion figure is based on current estimates of cost in relation to capacity: $15 per annual ton of production.

Sheet Metal Group Elects

PRESIDENT of the National Association of Sheet Metal Distributors for the coming year is Ray P. Farrington, Potts-Farrington Co., Philadelphia. He succeeds John P. Speck, Tiffin Art Metal Co., Tiffin, O., as head of the association.

Alexander Thomson, Tanner & Co., Indianapolis, and William H. Bowe, Herrick Co., Boston, are vice presidents of the association. Thomas A. Fernley Jr. and Robert C. Fernley, both of Philadelphia, will continue to serve as executive secretary and secretary, respectively.

Foundry Association Meets

NATIONAL Foundry Association will hold its 51st annual meeting at the Waldorf-Astoria in New York Nov. 10 and 11.

Among the speakers will be Dr. Leo Wolman, director, National Bureau of Economic Research, who will speak on government, labor and industry; Representative Harold H. Velde, Illinois, who will discuss the methods to stop the trend toward statism; and Stevens H. Hammond, president of Whiting Corp., whose subject is "Our Best Foot Forward."

CALENDAR OF MEETINGS

Oct. 24-25, National Association of Suggestion Systems: National fall conference, Hotel Statler, Cleveland. Headquarters are at 122 S. Michigan Ave., Chicago 3.

Oct. 24-28, National Safety Council: National safety congress and exposition, Stevens, Congress and Morrison Hotels, Chicago. Council headquarters are at 20 N. Wacker Dr., Chicago.

Oct. 26, American Iron & Steel Institute: Fourth regional technical meeting, Hotel Thomas Jefferson, Birmingham.

Oct. 26-27, National Conference on Industrial Hydraulics: Sheraton Hotel, Chicago. For details, write Otto J. Maha, Hannifin Corp., Chicago.

Oct. 26-28, National Metal Trades Association: 1949 convention, Palmer House, Chicago. Headquarters are at 122 S. Michigan Ave., Chicago 3.

Oct. 27-28, Porcelain Enamel Institute: 18th annual meeting, French Lick Springs Hotel, French Lick, Ind. Headquarters are at 1010 Vermont Ave., Washington 5.

Oct. 27-28, Gray Iron Founders' Society Inc.: 21st annual meeting, Edgewater Beach Hotel, Chicago. Society headquarters are at 210 National City-East 6th Bldg., Cleveland.

Oct. 28, American Institute of Mining & Metallurgical Engineers: Annual fall meeting, Pittsburgh section of Open Hearth Committee, Iron & Steel Division and Pittsburgh Section, AIME, William Penn Hotel, Pittsburgh. Institute headquarters are at 29 W. 39th St., New York.

Oct. 28, Illinois Mining Institute: 57th annual meeting, Hotel Abraham Lincoln, Springfield, Ill. Institute heaquarters are at 28 E. Jackson Blvd., Chicago.

Oct. 30-Nov. 2, National Tool & Die Manufacturers Association: Annual meeting, Hotel Statler, New York. Association heaquarters are at 1412 Union Commerce Bldg., Cleveland.

Oct. 31—Nov. 1, American Machine Tool Distributors' Association: 25th anniversary meeting and banquet, Hotel Gibson, Cincinnati. Office of the secretary is at 505 Arch St., Philadelphia 6.

Nov. 1-5, Pacific Chemical Exposition and Pacific Industrial Conferences: Running concurrently at San Francisco Civic Auditorium.

Nov. 2, American Iron & Steel Institute: Fifth regional technical meeting at the Waldorf-Astoria, New York.

Nov. 2-4, American Society of Civil Engineers: Fall meeting, Washington. Society headquarters are at 33 W. 39th St., New York.

Nov. 3, Society of Advancement of Management: Annual banquet, Hotel Statler, New York. Society headquarters are at 84 William St., New York.

Nov. 2-4, Industrial Management Society: 13th annual time and motion study clinic, Sheraton Hotel, Chicago. Society public relations headquarters are at 176 W. Adams St., Chicago.

Nov. 2-4, American Society of Civil Engineers: Fall meeting, Washington.

Nov. 2-4, American Society of Body Engineers: Fourth annual technical convention, Rockham Memorial Building, Detroit.

Nov. 2-4, Triple Mill Supply: Meeting of presidents, secretaries, convention and executive committees of American, Southern and National associations, at the Homestead, Hot Springs, Va. Headquarters of American Supply & Machinery Manufacturers' Association are at 1108 Clark Bldg., Pittsburgh.

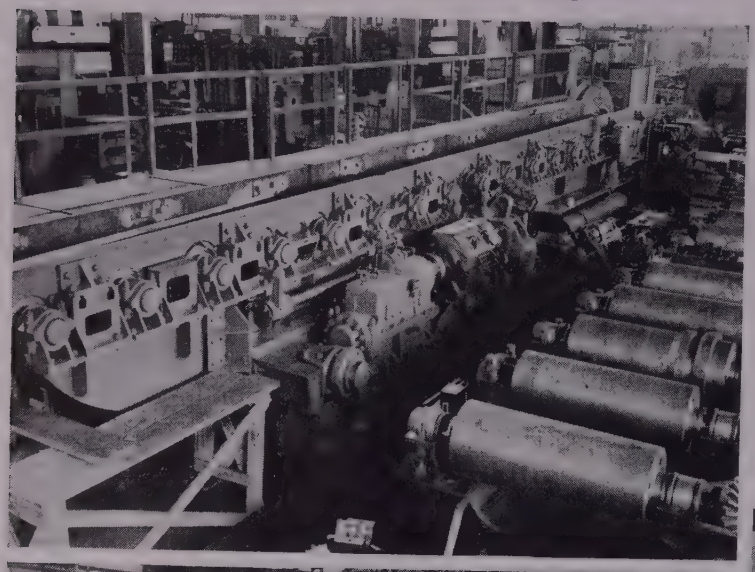
Nov. 3-4, Metals Casting Conference: Sponsored by Purdue University, Lafayette, Ind.

Nov. 10, American Iron & Steel Institute: Sixth regional technical meeting, at the Mark Hopkins Hotel, San Francisco.

Nov. 10, Purchasing Agents Association of Chicago: Meeting, Hotel Sherman, Chicago. Association headquarters are at 134 N. LaSalle St., Chicago.

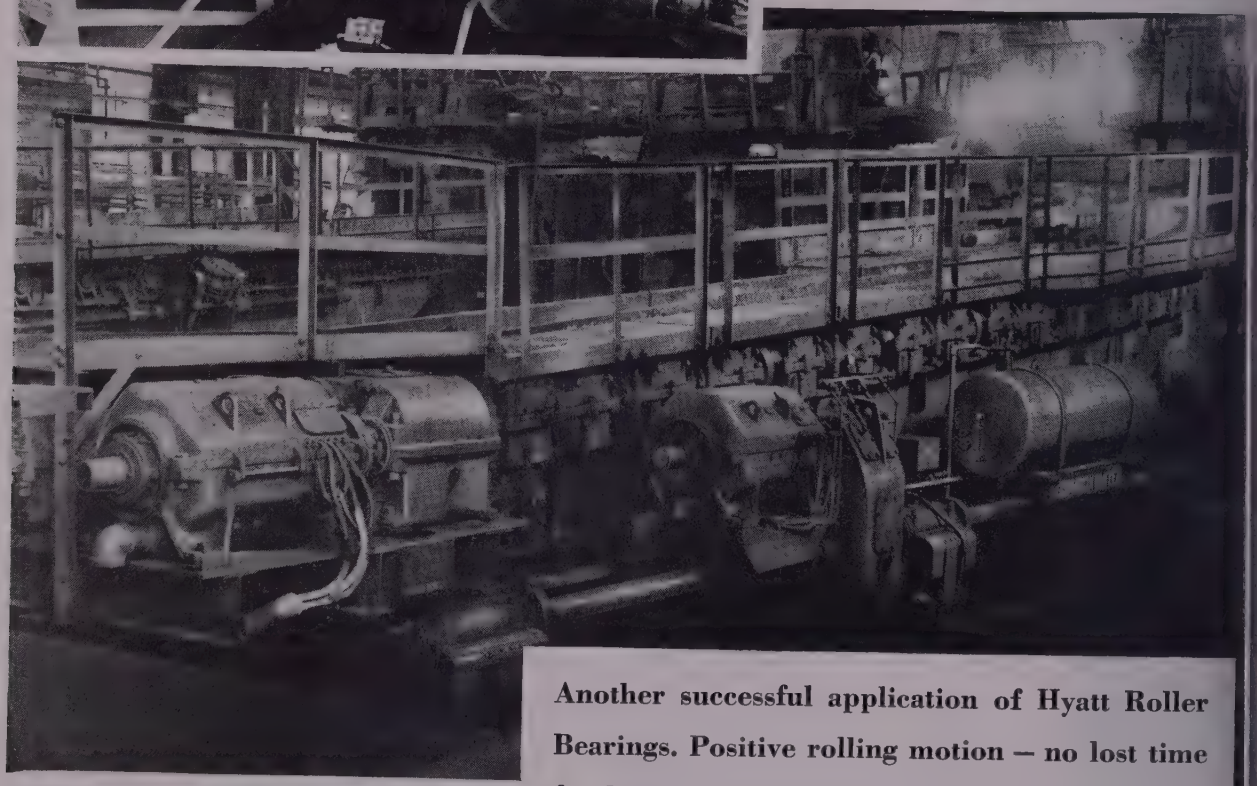
Nov. 10-11, American Management Association: Meeting on industrial cost reduction, at Palmer House, Chicago. Association headquarters are at 330 W. 42nd St., New York.

Dominion Engineering Built fo
Algoma Stee

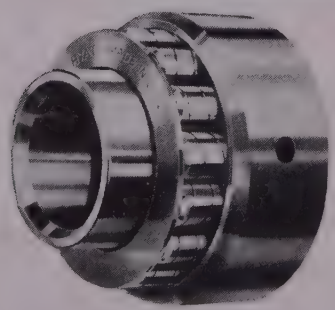


Hyatt Roller Bearings are used on both table roll journals and the lineshaft o the Traveling Tilt Tables at Algom Steel in Sault Ste. Marie, Ontario.

Left: Under construction at Dominion Engineering Works, Lachine, Quebec, and now in use at Algoma Steel rail and structural mill as shown below.



Another successful application of Hyatt Roller Bearings. Positive rolling motion — no lost time for bearing replacement or repair . . . a lifetime of performance.



In cranes, cars, motors, and other auxiliary equipment, too, Hyatt Roller Bearings are serving equally as well. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

HYATT ROLLER BEARINGS

. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Steel supplies of automakers begin to dwindle. Two more weeks of production is all the most optimistic predict. Wide cold-rolled sheets to be bottleneck

DETROIT

UT two more weeks is all the optimistic give the automotive dustry, as steel stocks dwindle to nevanishing point. While supplies f ome types of flat-rolled material re adequate for a much longer eriod, there are the usual bottle-ecks in which purchasing depart-ents are squirming furiously. Wide old-rolled sheets for roofs, hoods n fenders probably are the most rical, although the average auto ompany executive maintains stoutly principal danger to continuing ..sembles lies with suppliers. Posi-ion of the latter varies widely, some aintaining they can outlast the steel tocks of the auto plants, others just tistling in the dark and keeping heir fingers crossed.

here has been a rush to ware-ouses in the effort to balance out tel stocks and one interest here, specializing in flat-rolled steel, has said its supplies were scheduled to be exhausted by last Wednesday, after trying to satisfy a swarm of set buyers in the last few weeks.

This Is Showdown—The feeling is growing that "this is it," the ulti-mate showdown with monopoly union-ism which had to come sooner or later, and a certain sense of relief is evident in Detroit's thinking. The fantastic degree to which union lead-ers have gone to support demands going beyond all reasonable limits is just not going to stick this time, and you get the occasional expres-sion from people you talk to: "We hate to God Big Steel does not weaken."

One of the more ludicrous aspects of the steel strike is right here in Detroit at Great Lakes Steel Corp. The company's nine-year pension plan, of the contributory type, pro-vides benefits far surpassing the min-imum recommendations of the fact-finding committee, and Great Lakes has been repeating all the details in full-page advertisements in the three Detroit papers, messages which have been appearing for approximately ten days in a row.

Redoubles Picketing—The only re-sult has been that the USA-CIO local at the plant redoubled its pick-eting efforts, even sending boats out into the Detroit river on "water pick-eting" patrol, which of course promptly made the headlines.

The company was forced to close down coke ovens due to the failure of transportation employees to report to work, and this drew further re-criminations from the union. A crew of supervisory maintenance employ-ees stationed in the plant to keep the heat on open-hearth furnaces was virtually barricaded by union pickets and it was questionable how long plant food supplies would last.

May Use Planes—Sustenance prob-ably can be flown in if eventually necessary, but it would not be sur-prising to see the union mount an "air picket" line in such a case—perhaps even leading to dog-fights in the sky between pickets and those trying to supply the plant mainte-nance gang. Most of the Great Lakes office personnel have been closed out of their jobs by pickets, although some clerks have been admitted.

When one union international of-ficial was questioned about the trouble, he said it resulted from "untrue" statements which the com-pany had been publishing in its news-paper advertisements. Asked further about just what was untrue in these presentations, this USA officer re-plied that he was not familiar with the facts of the situation at all, he was just directing the strike activity. You can put that statement right across the board for the majority of steelworker union leaders through-out the country.

New Model Planning Upset—Up-shot of the whole materials mess has been to throw new model planning of the major sections of the industry into utter confusion. Plans for No-vember unveilings now have gone into the "maybe" stage since there is little use in bringing out some-thing new if the wherewithal to build it is not there.

Thus last week Hudson held an off-the-record preview of its smaller and lower-priced model scheduled to appear around Nov. 20 officially and while company officials tried to drum up enthusiasm over its possibilities, you could tell their heart was not in it, because they were not even sure they could have all their deal-ers sampled by the scheduled in-troduction time.

It is no secret that Hudson has built several hundred of the new Pacemakers and has shipped them out to dealers who promptly stack them away in the back room under canvas. Price, performance and en-gineering details will have to wait, but do not expect any sensations.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	604,351	489,736
August	678,092	478,186
September	647,000*	437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
Oct. 1	151,593	121,475
Oct. 8	148,443	119,398
Oct. 15	147,323	123,185
Oct. 22	142,000	123,067

Estimates by Ward's Automotive Reports

Production Pace Slows

SLOWING of the current production pace throughout the industry can be attributed either to the steel strike or to field stocks which have grown a little beyond what might be considered normal. Official pronouncements lay the blame on the steel situation, the boys in the back-room hint otherwise. There are an estimated 700,000 new cars now in the hands of dealers and in transit, so even if the entire industry closed down for a month, the public would be able to buy all the cars it wanted. Nevertheless, the situation is made to order for dealers who are beginning to wonder whether they might not be wise to tighten up a little on trade-in allowances after the relaxation of the past few months.

One prominent auto executive assesses the retail market as perfectly sound. He says the picture to-

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day is just a matter of the public becoming overly cautious in its buying habits, although still loaded with the cash to make purchases. On the theme that "action is always followed by reaction," he likens the condition today as the aftermath of the hectic buying surge of the immediate postwar years.

Assemblies Cut—Figure it out for what it is worth: Packard has cut its assembly schedules in half. Kaiser-Frazer is shutting down for an indefinite period — no explanation offered. Willys-Overland is down again for a week—balancing inventories. General Motors has stopped all overtime operations. General Motors Truck Division has cut back schedules by 20 per cent. Mercury has trimmed output by 10 per cent. Ford is easing up. Hudson was down for a week, is now resuming at a slower pace. Nash is slowing its schedules. Studebaker has cut off Saturday operations, in force during September. Cadillac has gone back to an 8-hour day. Nothing drastic, of course, but it tabs the tempo of the times. From here on out, it's anybody's guess.

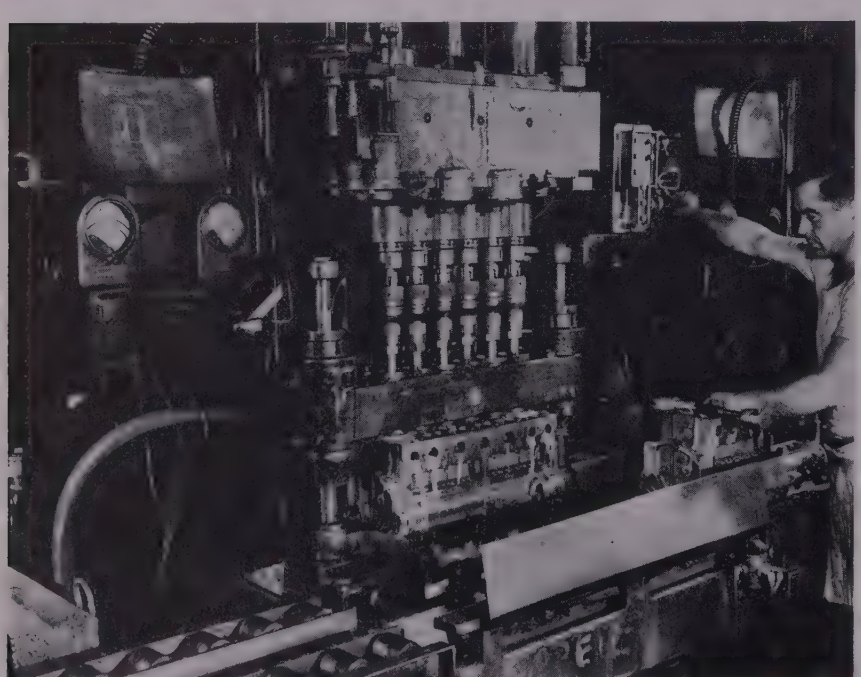
New Honing Method Developed

LONG experimentation at Studebaker has developed a method for honing cylinder bores within 0.0003-0.0004 inch out-of-round on a production basis with no rejection of cylinder blocks traceable to eccentricity or taper.

In years past the bores had been honed according to the generally accepted method of using oil as a coolant, but the result was too many blocks which had to be scrapped or rehoned. The trouble seemed to center in the fact that bores were o.k. when hot immediately after honing, but were screwy when they reached inspection.

According to Studebaker, the problem was battled for some 13 years, and appears to have been licked by the substitution of a water-soluble coolant, a product of the S. H. Mack & Co. Inc., and used in proportions of 20 to 1. Representatives of several abrasive manufacturing companies developed specifications for honing sticks which had to be changed in the switch from oil to water-base coolant. Water-soluble material also is used for seating and tapping the block so that it will be clean when it reaches the honing station.

Shows Little Wear — Since the bores come out of the honing machine cool, what happens when they become hot under operative conditions? Says Studebaker: An engine was run for 50 hours at 4500 rpm under full load, the equivalent of 4250 miles at 85 mph. Torn down for examination, the unit showed an insignificant amount of wear and a truer contact between piston rings and cylinder wall than under the old finishing system. Honing lines still were visible on the bores. Not only that, but the new honing job is cleaner, degree of roundness and straightness is a little less than perfect, production cost has been cut, and honing time reduced from 16 to 7½ seconds.



Cleanliness is a feature in new method of honing cylinder bores

More Die Castings Used

BY THE WAY, C. R. Maxon of New Jersey Zinc Co. supplies information that the new Studeb models carry 11 more pounds of die castings than previous jobs. grille, formerly a steel stamping, comprises two die castings, weighing 3 pounds. The airplane-front end spinner is a new die ing weighing 5 pounds. In addi the front fender "eyebrows" somewhat heavier, as well as rear tail light housings. Headl bezels are now die cast, adding ther to the zinc poundage. seems to confirm a trend deve ing in the auto industry toward stitution of die castings for r steel sections of a decorative na Oldsmobile, it will be recalled, one of the longest die castings produced in its rear fender mol

K-F Builds in West

ALTHOUGH production operatio Kaiser-Frazer have been suspe for the time being—not becaus the steel strike or any impen model change—construction has st ed on a $350,000 assembly plan Portland, Oreg. Scheduled for c pletion early in 1950, the plant have capacity for 20 cars a day will employ a modest 100. Com ent production parts, inclu primed bodies shipped 16 to a road car, will be received from K-F plant at Willow Run, and be assembled, painted and trim Operating supplies, along with s production parts, will be purch in the Oregon area.

The plant is of one-story des 200 x 250 feet in size. Produc operations, including body, cha and final assembly lines will be centrated in two 100-foot flanked by auxiliary office sp boiler room and locker rooms. spur lines serve the plant, with s ping and receiving operations tered at a covered railway dock w will run the entire length of building.

Oil Reserves Adequate

AMONG other things, last week oil progress week, and at a Day O., dinner, C. F. Kettering, Gen Motors research consultant, haste to assure his listeners that gov ment and industry surveys prove troleum reserves are more than quate to the nation's present and ture fuel needs.

Mr. Kettering noted that if pe leum reserves ever run low, the sibilities of shales, coals and nat gas will make up any deficiency.

When These 6,377 Fasteners Pay Off!

)k sky . . . wind . . . devastating
mean there's no time to lose.
you give 'er everything she's
and pray you'll get in most of
crop before it's too late. That's
n the holding power of the
7 fasteners in this combine re-
pay off.

367 bolts . . . 415 cap, set and
ping screws . . . 1840 rivets . . .
25 nuts form the steel network
locks the framing members of
combine together.

ecause these fasteners are call-ed upon to hold their own on a rugged day-in and day-out schedule, top quality is essential. That's why Russell, Burdsall and Ward with 104 years' experience still carries on intensive research and development work to improve fastener holding power further.

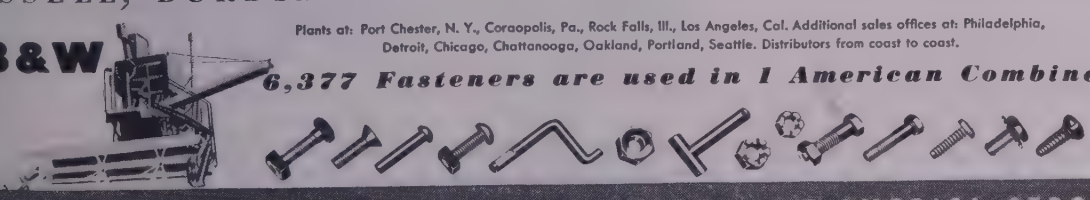
It is unsound economy to use inferior fasteners, since the price of fasteners is such a small part of the total product cost. It isn't the initial price but the cost of *using* fasteners that counts.

To attain *True Fastener Economy*, you can save assembly time, reduce plant inspection, and get the maximum holding power per dollar of fastener cost with a dependable quality fastener. *True Fastener Economy* contributes to the kind of production savings that put more and more combines on U. S. wheatfields every year. It is this type of contribution to major American industries that explains why—for over 104 years—RB&W has been *making strong the things that make America strong.*

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Cal. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

RB&W ***6,377 Fasteners are used in 1 American Combine***



OT YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

More Industry Alignments: Three Firms Sold

Three more industry alignments were brought about through the sale of three firms to new or established interests. A fourth company bought a factory site for a new plant.

Bowser Inc. Sells Unit

R. H. Damon, chairman of Bowser Inc., announced sale of all physical assets and property of Fostoria Screw Co. and all real property and machinery of Bowser Inc., Fostoria, Ind., to the Rose-Mankowitiz group of Cincinnati.

Fostoria Screw is a subsidiary of Bowser Inc. Sale price was not disclosed. The purchaser has formed a new corporation, Fostoria Screw Co. Inc., which will continue former business of Fostoria Screw with the same personnel.

In Illinois a packaging and materials handling firm bought a bakery equipment manufacturer.

AMF Buys Union Machinery

Union Machinery Co., Joliet, Ill., was bought by American Machine & Foundry Co., New York. Union makes bakery equipment: Bread dough dividers, rounder proofers, hoppers, dough chutes, and an automatic roll divider and rounder. American Machine & Foundry, manufacturer of automatic machinery since 1900, makes cigaret making and packaging equipment, stitching machinery and materials handling devices.

A Chicago tool company also was sold and will be transferred to Syracuse, N. Y.

Chicago Tool Company Sold

Manufacturing facilities of Sterling Electric Tool Products Co., Chicago, which were sold to Porter-Cable Machine Co., Syracuse, N. Y., will be moved to Syracuse for production of Sterling portable electric and pneumatic sanders. DeAlton J. Ridings is president of Porter-Cable.

Acquisition of Sterling is the second within a year. Last fall Porter-Cable bought Unit Electric Tool Co,

Purchase of a site for a new factory will give American Can Co. a third operating unit in Baltimore.

American Can Buys Site

Purchase of a 43-acre tract on the southwest limits of Baltimore from the Baltimore & Ohio Railroad for a milk container factory was made by American Can Co., New York.

C. H. Black, Canco president, says about 250 persons will be employed in the new plant, scheduled for completion within a year. It will have almost 150,000 sq ft of floor space at the start and provisions for future expansion. Demand for the milk containers, a prewar company development, has taxed existing production facilities and restricted supply of containers to large metropolitan areas. New plant will make larger supplies of paper milk containers available to dairy customers on the Atlantic seaboard and in the South.

New Meehanite Development

MEEHANITE Metal Corp., New Rochelle, N. Y., notified all foundries which produce Meehanite castings under contract with the company that it has established production techniques to enable the foundries to produce nodular graphite Meehanite metal on a commercial scale.

Meehanite metallurgists have developed a new process of making nodular castings with a special device and by means of treatment that assures accurate control of physical properties.

Crown Concentrates Facilities

MANUFACTURING facilities of Crown Can Co., subsidiary of Crown Cork & Seal Co., will be concentrated at its main plant in Philadelphia and its branches in Chicago and Orlando, Fla. Operations in the Baltimore area, now conducted in a portion of the company's main plant at Highlandtown, Md., will be transferred to the Philadelphia plant. Crown Cork & Seal, in need of additional facilities for its closure business, will take over the buil used by the subsidiary.

Crown Cork, also finding it ne sary to increase production of b caps in St. Louis, will remove can manufacturing operations to Crown plant in Chicago. Operat of Crown Can's Houston plant, w manufactures cans only, will be continued, it is understood.

Guided Missiles Research

RESEARCH in specialized probl of guided missiles will be condu by North American Aviation In a new laboratory under construc at its Downey, Calif., plant.

Estimated to cost $50,000 initi it will be the first privately ov laboratory in southern California voted exclusively to problems of tremely high altitude, "G" loads vibration, extremes of tempera and humidity, and problems inhe in gyro-mechanisms.

Expansion Program Complete

COMPLETION of a program of p expansion and equipment impr ment, at a cost of $250,000, has creased capacity of the gray foundry operated by American nace & Foundry Co. and Amer Boiler & Foundry Co., Milan, M The postwar program was steppe when the companies became sub aries of Maumee Malleable C ings Co., Toledo, O. Six and a acres of plant facilities are used production of castings for the a motive, tractor, laundry equipm heating, and machine tool indust

WEST COAST PIG IRON CAPACITY DOUBLED: Kaiser Steel Corp.'s second blast furnace to be blown in gives the Fontana, Calif., plant a potential pig iron capacity of 2400 tons daily, double previous output. New furnace is to the right of original unit which produced continuously since 1943 except for one shutdown for relining

Briefs . . . .

Paragraphs on developments of interest and significance within the metalworking industry

Merritt Plywood Machinery Co. is the name under which the former Merritt-Chapman & Scott Corp., Lockwood, N. Y., manufacturer of wood working machinery, will operate.

—o—

Troy Engine & Machine Co., Troy, N. Y., has bought the Brasington Machine Co., Cincinnati, manufacturer of rolling mills for grinding in the making of paint and ink. Brasington facilities will be moved to Troy.

—o—

Cincinnati Milling Machine Co. celebrated its 65th anniversary with an open house and inspection of all departments. Employees, their families and guests took part in the program which included a special celebration for employees with the company at least 25 years.

—o—

American Manganese Steel Division of American Brake Shoe Co., New York, appointed Whitehead Metal Products Co. Inc. as distributor of its complete line of Amsco welding products. Line consists of various types of rods and electrodes for hard facing and repair work and tungsten carbide tools. Whitehead has warehouses in New York, New Jersey, Pennsylvania, Massachusetts and Maryland.

—o—

Mt. Vernon & Jacobs Mfg. Co. is the name of the former Case Crane & Mt. Vernon Jacobs Co., manufacturer of cars, trucks and road machinery. Greater emphasis will be placed on the K & J line, but Case Crane products still will be produced.

—o—

Townsend Co., New Brighton, Pa., manufacturer of rivets, bolts, nails and special fasteners, established a new sales office in Philadelphia. Edward T. Brown heads the office which will cover most of the eastern seaboard.

—o—

Westinghouse Electric International Co. Pittsburgh, is carrying out projects involving: Lighting for a world's fair in Haiti, a baseball park in Puerto Rico and the main street in Venezuela's capital.

—o—

Industrial Product Sales Inc., Akron, sales representative for Logan Machine & Metal Stamping Co., Akron, in the Ohio and Michigan area. Logan produces metal stampings and specializes in automotive and rubber company work.

—o—

GilLair Products Inc., Pasadena, Calif., will manufacture under a series of exclusive patents, the All-Flex ball-bearing swivel pipe coupling which has a wide variety of industrial applications. Gil-Lair also manufactures flexible steel hose, mud guns and circulating heads.

—o—

Rucker Co., Los Angeles, a specialist in application of fluid power units and systems for industrial use, is now at 1855 Industrial St.

—o—

Carboloy Co. Inc., Detroit, appointed W. L. Reynolds Co., Baltimore, as an additional distributor in Baltimore for cutting tools, grinding wheels and abrasives.

—o—

Childers Mfg. Co., Houston, developed a new off-the-job, tailor-made roofing and siding fabricating service adapted for the type of industrial building usually sheathed with corrugated metal or asbestos.

—o—

B. C. Ames Co., Waltham, Mass., manufacturer of micrometer dial indicators and gages, appointed Hal W. Reynolds Co., Cleveland, exclusive sales representative in northern Ohio.

—o—

American Optical Co. is broadening and diversifying its manufacturing operations at its Buffalo plant which has been renamed the Instrument Division. Machinery is being transferred from the company's Southbridge, Mass., plant for production of additional items.

—o—

Solar Aircraft Co., San Diego, Calif., which got $2.1 million worth of orders for jet engine parts, will be able to maintain its present rate of production and employment. New orders were distributed between the company's Des Moines, Iowa, and San Diego plants.

—o—

Resistance Welding Institute, Cleveland, is offering a 32-page booklet explaining and illustrating advanced techniques in resistance welding processes. Write to the institute, Hartman Bldg., Detroit Ave. & Warren Rd., Cleveland 7. Publication covers theory and application of spot, seam, projection and butt welding.

—o—

Fairbanks, Morse & Co., Chicago, opened a diesel locomotive sales office for the Cleveland area. C. A. Mapp is district sales representative; H. D. Buckner is area service supervisor. They will be located in the company's Cleveland branch house, 2810 Superior Ave.

—o—

Ennis Supply Co., Minneapolis, purchased the entire inventory of Buday portable table saw from Nordberg Mfg. Co., Milwaukee. Ennis also received complete rights to manufacture the gas-powered saws used by lumber dealers, contractors, etc.

—o—

Gunnison Mfg. Co. and **Schilling Machine** shop, Baraboo, Wis., will manufacture new cultivators for Ford and Ferguson tractors under a partnership arrangement. C-H cultivators, as they are to be called, will be distributed through Goodman Equipment and Supply Co., Baraboo.

—o—

Jamestown Safety Guard Corp., a new firm in Jamestown, N. Y., is producing safety shields for various types of machinery. The safety device is an invention of George S. Anderson, vice president of the firm.

—o—

Parker Appliance Co., Cleveland, O., appointed Irving B. Moore Co., Boston, as distributor for Parker O-rings which seal hydraulic and other fluid handling systems.

—o—

Allis-Chalmers Mfg. Co., Milwaukee, started a program of giving 20 annual scholarships of $500 each for children of company employees.

—o—

American Home Laundry Manufacturers' Association, Chicago, reports factory sales of standard size household washers in August were greater than in any month since October, 1948. August total was 323,789 units, an increase of 61 per cent over 200,900 units sold in July. August sales of ironers were 32,300 units, compared to 17,700 in July, an increase of 82.5 per cent.

—o—

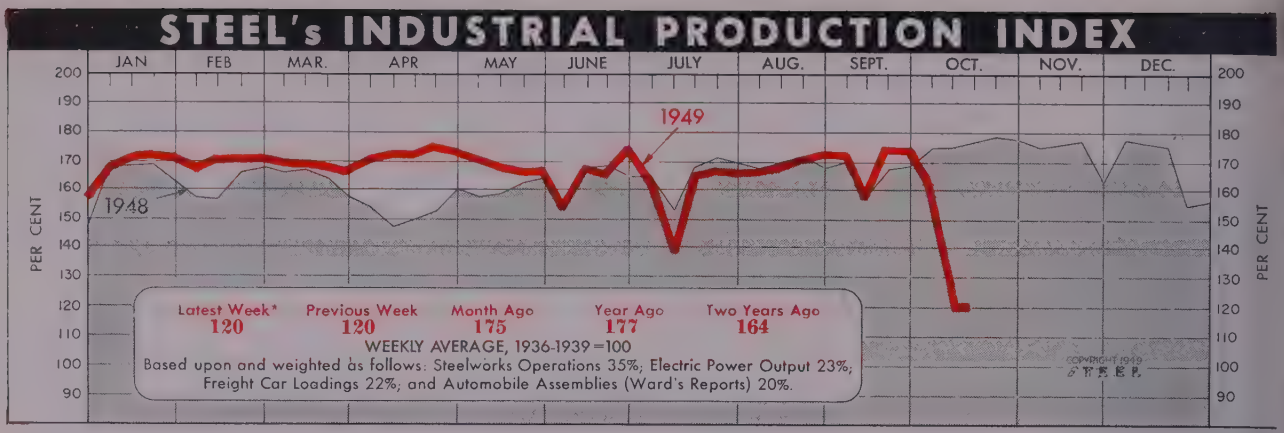
Cleveland Republic Tool Corp.'s assets were offered for public sale when a private offer of $75,000 was rejected in the hope a public auction would bring more.

—o—

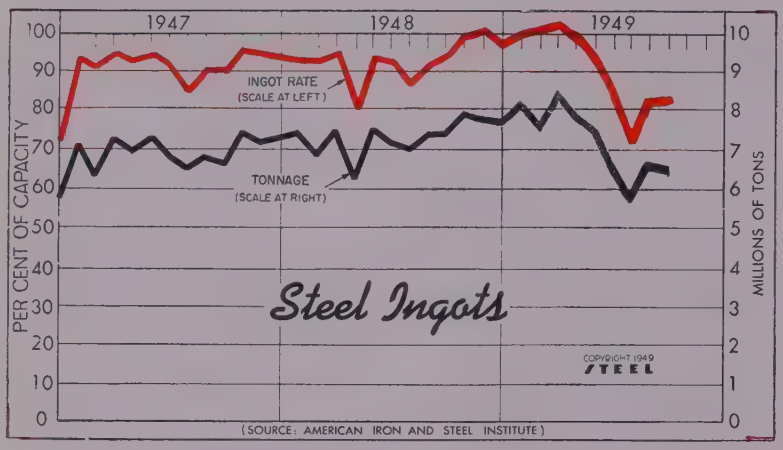
Osgood Co. and **General Excavator Co.**, Marion, O., appointed Equitable Equipment Co., New Orleans, as distributor of Osgood and General excavating and materials handling machinery in southern Louisiana and the southernmost counties of Mississippi.

—o—

Hanover Steel Corp., wholly owned subsidiary of Solar Steel Corp., Cleveland, will operate as the Hanover Division of Solar. The division is a steel warehouse and processor serving customers of flat-rolled steel products in the eastern area.

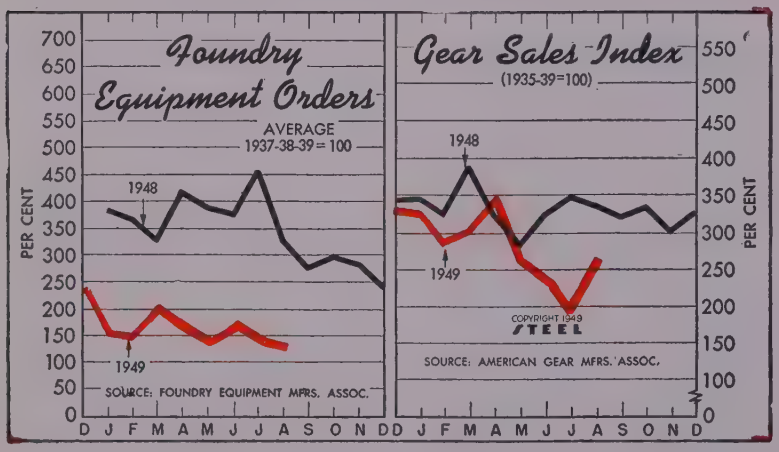


* Week ended Oct. 15 (preliminary).



Steel Ingots

	Production (Net Tons—000)			Operating Rate (% of Capacity)		
	1949	1948	1947	1949	1948	1947
Jan.	8,183	7,473	7,213	100.2	93.6	93.2
Feb.	7,481	6,940	6,422	101.4	93.0	91.9
Mar.	8,388	7,608	7,307	102.7	95.3	94.4
Apr.	7,785	6,218	7,043	98.4	80.4	93.9
May	7,590	7,572	7,329	92.9	94.8	94.7
June	6,498	7,256	6,969	82.2	93.8	92.9
July	5,781	7,067	6,570	70.9	88.7	85.1
Aug.	6,715	7,438	6,982	82.2	93.1	90.2
Sept.	6,572	7,416	6,789	83.3	96.1	90.8
Oct.	....	7,987	7,560	....	100.0	97.7
Nov.	....	7,787	7,233	....	100.7	96.5
Dec.	....	7,771	7,366	....	97.5	95.4
Total	....	88,534	84,784	Ave. ...	94.0	93.0


Foundry Equipment Orders
AVERAGE 1937-38-39=100
1948
1949
PER CENT
SOURCE: FOUNDRY EQUIPMENT MFRS. ASSOC.
Gear Sales Index
(1935-39=100)
1948
1949
COPYRIGHT 1949 STEEL
SOURCE: AMERICAN GEAR MFRS. ASSOC.
PER CENT
D J F M A M J J A S O N D D J F M A M J J A S O N D

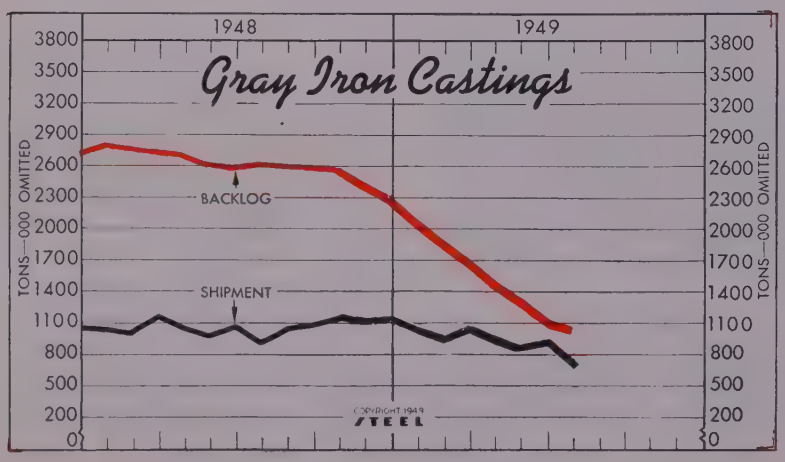
Foundry Equipment Orders*

	Index (1937-38-39=100)	
	1949	1948
Jan.	149.9	380.9
Feb.	144.4	367.3
Mar.	190.8	326.2
Apr.	172.0	412.0
May	121.9	388.5
June	164.9	376.8
July	146.6	456.3
Aug.	127.1	324.7
Sept.	....	273.5
Oct.	....	296.0
Nov.	....	284.4
Dec.	....	243.7

* By foundry trades only.

Gears Sales

	Index (1935-39=100)	
	1949	1948
Jan.	320.7	346.8
Feb.	282.3	324.4
Mar.	299.1	389.8
Apr.	339.0	320.9
May	250.1	283.6
June	227.8	324.1
July	193.1	348.4
Aug.	262.0	335.6
Sept.	....	320.4
Oct.	....	333.3
Nov.	....	309.0
Dec.	....	325.9



Gray Iron Castings

(U. S. Bureau of Census)

Tons—000 omitted

	Shipments		Backlogs*	
	1949	1948	1949	1948
Jan.	1,040	1,064	2,065	2,803
Feb.	987	1,024	1,857	2,769
Mar.	1,075	1,169	1,639	2,726
Apr.	929	1,051	1,446	2,691
May	867	993	1,243	2,602
June	906	1,072	1,087	2,587
July	697	914	1,032	2,601
Aug.	....	1,051	....	2,599
Sept.	....	1,088	....	2,587
Oct.	....	1,148	....	2,523
Nov.	....	1,100	....	2,407
Dec.	....	1,111	....	2,284
Total	....	12,786		

* Unfilled orders for sale to the trade.

The Business Trend

PARTIAL paralysis of the metalworking and metal-producing industries continued unchanged in the week ended Oct. 15. STEEL's industrial production index for the week remained at 120 per cent of the 1936-1939 average. Prospects for immediate improvement in the level of industrial production are not bright and the index probably will go lower. Even though the production index has skidded sharply it is being sustained to some extent by continued high production in the automobile industry. Shutdown of the automobile plants because of a lack of steel would result in another sharp decline in industrial production.

In the corresponding week a year ago the index was at 177 and heading toward the postwar high. Comparison of latest week figures with those for a year ago in the tables at the bottom of this page shows both the extent of the decline and the sustaining factors in maintaining the current level of the industrial production index.

AUTOMOBILES—Production of passenger cars and trucks in the week ended Oct. 15 totaled 147,323 units. Thus the automotive industry remained a bright spot in a rather gloomy production picture. Before the end of this month the industry's 1949 production will surpass that for all of 1929, up till now the best production year. Not all is serene in the industry, however. Plant shutdowns are imminent for some builders because of shortages of certain types of steel and even those with better stocks probably will be unable to produce much beyond Nov. 1.

CARLOADINGS—Freight carloadings were down to 574,228 cars in the week ended Oct. 8, lowest point since May, 1946. Strikes were also the reason for the earlier low figure.

COAL—Bituminous coal output rose slightly to 2.2 million net tons in the week ended Oct. 8 from 1.8 million tons in the preceding week. The increase resulted from the return to work of United Mine Workers miners west of the Mississippi, adding to output of nonunion mines and those employing Progressive Miners.

TRUCKLOADINGS—American Trucking Associations reports the volume of freight transported by motor carriers in August increased 17.8 per cent over July and 5.9 per cent over August, 1948. Carriers transported an aggregate of 3,497,043 tons in August, compared with 2,968,818 tons in July and 3,300,796 tons in August a year ago. Carriers of iron and steel hauled about 5 per cent of total tonnage.

CONSTRUCTION—September building and construction contracts awarded in the 37 states east of the Rocky mountains aggregated $1,093,724,000. This was the highest total since June, 1942, when wartime construction was at its peak. Last month's volume canceled the deficits of earlier months and brought the dollar volume for the first three-quarters to 1 per cent higher than for the same period in 1948. Investments by private owners accounted for almost 75 per cent of the September total.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	8.0	7.5	86.5	98.0
	Electric Power Distributed (million kilowatt hours)	5,481	5,450	5,579	5,482
	Bituminous Coal Production (daily av.—1000 tons)	367	304	971	2,056
	Petroleum Production (daily av.—1000 bbl)	5,044	5,015	4,985	5,634
	Construction Volume (ENR—Unit $1,000,000)	$143.7	$152.4	$156.0	$170.2
	Automobile and Truck Output (Ward's—number units)	147,323	148,443	159,493	123,185
	*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.				
TRADE	Freight Carloadings (unit—1000 cars)	555†	574	743	914
	Business Failures (Dun & Bradstreet, number)	172	182	185	94
	Money in Circulation (in millions of dollars)‡	$27,546	$27,476	$27,454	$28,284
	Department Store Sales (changes from like wk. a yr. ago)‡	−12%	−8%	−4%	+10%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$10,477	$13,600	$12,830	$10,842
	Federal Gross Debt (billions)	$256.5	$256.6	$256.5	$252.4
	Bond Volume, NYSE (millions)	$14.1	$13.4	$14.3	$11.9
	Stocks Sales, NYSE (thousands of shares)	6,225	6,883	6,812	3,625
	Loans and Investments (billions)†	$66.1	$66.1	$65.7	$62.2
	United States Gov't. Obligations Held (millions)†	$37,252	$37,004	$37,378	$33,235
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	152.52	152.52	152.52	151.86
	STEEL's Nonferrous Metal Composite‡	170.6	172.2	180.3	221.1
	All Commodities†	152.1	152.3	154.6	165.0
	Metals and Metal Products†	169.2	169.2	169.5	172.1
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

Men of Industry

PHILIP B. NILES

A. CHARLES AMANN

WARREN INGERSOLL

Philip B. Niles has been elected a vice president of **Yale & Towne Mfg. Co.,** New York, effective Nov. 7. He will devote his attention to marketing and to the development of executive personnel throughout the company. Mr. Niles has been public relations director for Owens-Illinois Glass Co., Toledo, O., since early in 1948, and had previously been vice president of the American Water Works Co. **A. Charles Amann** has been appointed industrial sales manager, Stamford Division. He joined Yale & Towne in July, 1949, and previously served four years with Illinois Lock Co., Chicago, as vice president and director of sales and advertising. **James F. Manning** has retired as superintendent of the Stamford Division's finishing department, and is succeeded by **John E. Charleson.**

—o—

H. R. Salisbury has been appointed president, **Air Reduction Sales Co.,** New York. He has been with the organization over 23 years in various executive capacities. Appointed vice presidents were **H. F. Henriques,** general sales; **J. J. Lincoln Jr.,** railroad sales and sales services; **S. B. Stouffer,** distribution; and **N. L. Wisser,** field office management.

—o—

Richard T. McCauley has been appointed assistant for the Portable Products Division, **Herman Nelson Corp.,** Moline, Ill., to be in charge of government relations. In this division Herman Nelson Corp. has, since 1941, manufactured portable heaters and ventilators used by the military during World War II, and now used in both military and commercial fields. Mr. McCauley was recently separated from the United States Air Force. He will maintain offices in Washington.

—o—

Frank J. Nugent has been appointed sales manager of heating equipment, Ingersoll Steel Division, **Borg-Warner Corp.,** Chicago. He will have headquarters at Kalamazoo, Mich. He was previously connected with Bryant Heater Co. as sales promotion and advertising manager, and as general sales manager with the Appliance Division, Rheem Mfg. Co.

—o—

Spencer R. Griffiths has been appointed assistant sales manager of **Unistrut Products Co.,** Chicago. He formerly was associated with Joseph T. Ryerson & Son Inc., in charge of stainless steel sales in the midwest.

—o—

Harry A. Erb has rejoined **Elliott Co.,** Jeannette, Pa., as assistant to **M. A. King,** vice president in charge of engineering, with headquarters at the main plant. He had served as blower engineer, manager of the service department and manager of the electric power department of Elliott's Ridgway Division. **C. H. Hosterman,** for many years manager, accessories department, has been appointed manager, general apparatus department.

—o—

D. C. Wheeler, recently elected a vice president, **Mack Trucks Inc.,** New York, will head a newly created southwestern division with headquarters at Dallas. Included in this realignment of Mack's sales territory are the company's already established Dallas, Houston, Oklahoma City, Okla., and New Orleans offices, most of Texas, and New Mexico, Oklahoma, Arkansas, Louisiana, Mississippi, and Mexico.

Warren Ingersoll has been appointe assistant to the president of **Le Rubber & Tire Corp.,** Conshohocker Pa. Until recently he has represent ed the Lee corporation interests o the West Coast with headquarter in San Francisco, and has been Phil adelphia district manager of Lee' mechanical rubber division, the Re public Rubber Division, Youngstown

—o—

Duncan C. McPhee has been appoint ed sales manager, **Borden Meta Products Co.,** and will be located a the main office in Elizabeth, N. J He has been associated with the com pany for many years, and has been connected with the engineering de partment and also with the estimat ing department.

—o—

Westcott Chuck Co., Oneida, N. Y., announces appointment of **Herman H. Hobelmann,** 744 Harrison St., San Francisco, as its district representative in California, Oregon and Washington, and also the Reno district of Nevada.

—o—

Elwood E. Zerbe has been appointed field engineer in the Atlanta district for Nelson Stud Welding Division, **Morton Gregory Corp.,** Lorain, O. He joined the Nelson organization as a specialist on railroad applications last spring after four years with Franklin Railway Supply Co. in New York.

—o—

George L. Wheeler, formerly assistant purchasing agent of Wyeth Co., St. Joseph, Mo., has been appointed a sales representative of **White Metal Mfg. Co.,** Hoboken, N. J. He will cover Pennsylvania, Delaware, Maryland, Virginia, South Carolina, North

Is MOISTURE your magnet problem?

Here's an Ohio lifting magnet that operates underwater 50 percent of the time, retrieving hot crop-ends from a cooling pit. It is a standard Ohio bolted-type magnet which has not been waterproofed in any way!

This unusual application proves the extra margin of moisture protection built into every Ohio Magnet.

For longer magnet life and greater dependability, why not send your next order to Ohio—*25 years a leader in magnetic materials handling.*

Remember this picture next time you buy!

SELECT YOUR MAGNET from two Ohio types. The PROTECTO-WELD magnet, shown here, is made in 39, 46, 55 and 65-inch diameters. Bolted construction types include these and other smaller sizes.

THE OHIO ELECTRIC MFG. CO. • 5900 MAURICE AVENUE • CLEVELAND 4, OHIO

Ohio MAGNETS

A-1924

Carolina, Georgia and Washington, D. C., and will have headquarters in Philadelphia.

—o—

Clayton P. Yoder has been appointed

CLAYTON P. YODER

sales manager, Platecoil Division, **Kold-Hold Mfg. Co.,** Grand Rapids, Mich. His immediate activities will include establishing sales representatives in the leading industrial areas of the country. He will have charge of training personnel and general promotion of the products of the Platecoil Division.

—o—

John K. Bruce, designer of equipment for process industries, heads **Bruce Engineering Corp.,** San Francisco, recently formed to produce specialized marking and handling equipment for food packing plants, breweries, oil companies, and other packaging industries.

—o—

F. C. Tucker has been appointed purchasing manager, chemical department, Pittsfield, Mass., for **General Electric Co.** Until recently he has been assistant purchasing agent with Rohm & Haas Co. **William O'Neil Jr.** has been appointed plant manager of the Bowling Green, Ky., water cooler plant of General Electric's air conditioning department. Since joining the company in 1930 he has held various positions in planning and wage rate sections of the Erie, Pa., Schenectady, N. Y., and Ft. Wayne, Ind., works. **Robert J. Baumann** has been appointed an analyst in the marketing research section, marketing division, chemical department.

—o—

Joseph D. Kelly has been named sales promotion manager for passenger car and truck tires, **B. F. Goodrich Co.,** Akron.

—o—

Donald R. Wadle has resumed the position of commissioner of the **Metal Lath Manufacturers Association,** Cleveland, following a year's leave of absence because of illness. For the past 12 months this office was filled by **W. B. Turner,** who, until he retired in 1948, was manager, fireproof building materials department, Inland Steel Products Co.

—o—

Kurt A. Miericke has been appointed Chicago representative of **Michigan Oven Co.,** Detroit, to cover the sale of industrial ovens throughout northwestern Indiana, northern Illinois, Wisconsin and Iowa. He has been with U. S. Gypsum Co. as development engineer since 1944, and previously sold industrial x-ray equipment.

—o—

W. C. Chapman has been appointed senior field superintendent, **Freyn Engineering Co.,** Chicago, subsidiary of Koppers Co. Inc. **Robert K. Matthews** was advanced to general construction superintendent, and **Russell A. Powell** was appointed assistant chief engineer.

—o—

George E. Johnson has been appointed foundry superintendent, **New York Air Brake Co.,** Watertown, N. Y. He succeeds **L. W. Curtis,** retired after 22 years of service. Mr. Johnson has been with the company since 1915.

—o—

Cecil Packard has been named representative for **Arthur Colton Co.,** Detroit, in Michigan and western Ontario.

—o—

Frank J. Walton, former manager of sales, **Chandler-Boyd Co.,** Pittsburgh, has been elected to the board of directors, and also to position of vice president in charge of sales. **Byron B. Null,** former assistant controller, has been elected secretary-controller of the company to fill the vacancy left by the recent retirement of **W. W. Wiggins.**

—o—

J. J. Fitzpatrick and **R. H. Grimes** have been appointed district representatives, **Berger Building Products Sales Division,** Republic Steel Corp., Cleveland. Mr. Fitzpatrick will work out of the Indianapolis branch warehouse, and Mr. Grimes in a similar capacity at St. Louis.

—o—

Edward G. F. Arnott has been named acting research director, Lamp Division, **Westinghouse Electric Corp.,** at Bloomfield, N. J. Mr. Arnott, a specialist in the study of gas discharges for fluorescent lamps and electronic tubes, succeeds **Dr. Charles M. Slack,** recently appointed technical director, Atomic Power Division, Pittsburgh. **Ray H. Timmons** has been appointed manufacturing manager of industrial products for the corporation. **C. M. Clark,** formerly superintendent of manufacturing, Transportation & Generator Division, succeeds Mr. Timmons as manager of manufacturing for that division.

—o—

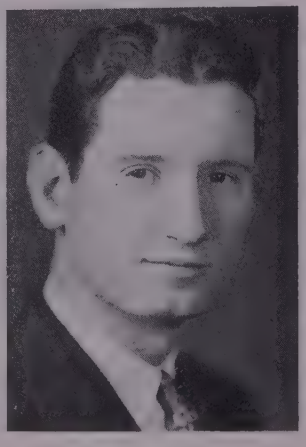
Foote Mineral Co., Philadelphia, announces addition of five men: **Harry B. Hunter** joins Foote research and development laboratory as a metallurgist; **J. M. Kishel** as a chemist, analytical section of the laboratory; **Edward Loveland,** ceramic research assistant; **Dr. Everett R. Johnson** as a research chemist for the corporation; and **David Coghlan** as a chemical engineer to conduct pilot plant studies for the research and development laboratory.

—o—

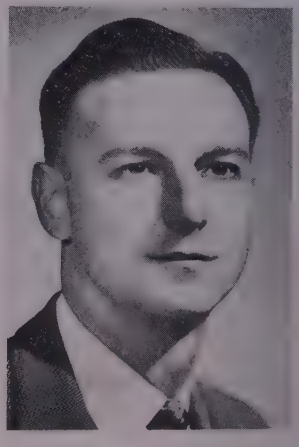
Dr. Nicol H. Smith has been appointed director of research operations of **Franklin Institute Laboratories,** Philadelphia.

—o—

R. W. Markley Jr., assistant to the



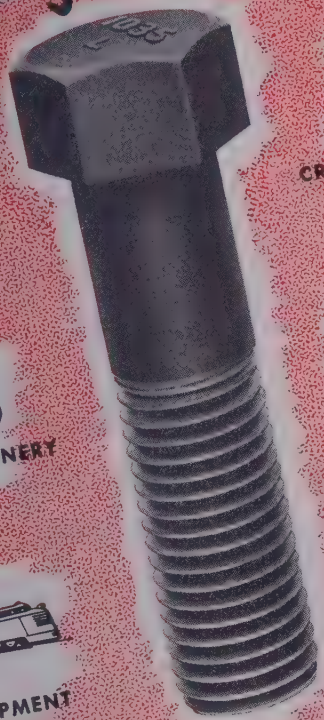
FRANK J. WALTON



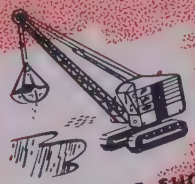
BYRON B. NULL

PLENTY TOUGH

when the going's ROUGH!



TRACTORS



CRANES • POWER SHOVELS

TRUCKS AND CARS

D BUILDING MACHINERY

HEAVY INDUSTRIAL MACHINERY

RAILROAD EQUIPMENT

LAMSON "1035" CAP SCREWS

Toughness . . . Strength . . . Precision

Accurately headed, precision threaded and *plenty rugged*—
that, in a nutshell, describes Lamson "1035" Cap Screws.

nson pioneered the "high tensile" Cap Screw after years of research
and "on the job" testing.

Today's "1035" product is precision-made on the finest type of bolt-making
machinery—and heat-treated automatically in furnaces
where the atmosphere is scientifically controlled.

As a result, the modern Lamson "1035" Cap Screw is unmatched
for strength, toughness and all-round quality.

at's why you'll be way ahead always to say "Lamson" *before* you say "Cap Screws."

THE LAMSON & SESSIONS COMPANY

General Offices: 1971 West 85th Street, Cleveland 2, Ohio

Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

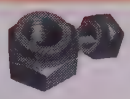
Lamson & Sessions

"One Dependable Source for All Fastener Needs"

SEMS	LOCK NUTS	NUTS	STUDS
STOVE BOLTS	LAG BOLTS	WASHERS	RIVETS
PPING SCREWS	ROPE CLIPS	SET SCREWS	PLOW BOLTS
5" CAP SCREWS	MACHINE BOLTS	CARRIAGE BOLTS	COTTER PINS

—CUT ALONG THIS LINE—

on any of these fastener
CHECK—and CLIP this str



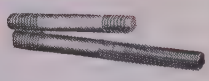
LAMSON LOCK NUTS: Economi
ical, vibration-proof. Can be
re-used repeatedly.

"1035" SET SCREWS: Cup point
type, hardened, heat-treated.

COTTER PINS: Steel, Brass, Alu
minum and Stainless Steel.

SPECIAL NUTS: Cone, Barrel,
Oblong, Plier, Tri-Slot, Half-
round, etc.

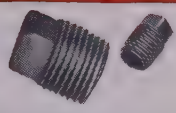
PHILLIPS AND CLUTCH HEAD
Machine Screws and Tapping
Screws.



MILLED STUDS: Concentric
accurate, in a full range of sizes

"BENT" BOLTS: Including U
Bolts, Eye Bolts, Hook Bolts, etc

WEATHER-TIGHT BOLTS: Elimi-
nate counter-boring in wood
assemblies.



PIPE PLUGS: Forged Steel,
heat-treated.

The Lamson & Sessions Compan
1971 W. 85th St., Cleveland 2, Ohi

NAME

POSITION

COMPANY

STREET

CITY ZONE STATE

director of contract requirements, Douglas Aircraft Co. Inc., Santa Monica, Calif., has joined **Aircraft Industries Association** as assistant to the director of the industrial planning service.

—o—

Roy C. Menzel, works manager at

ROY C. MENZEL

the Los Angeles plant of **General Metals Corp.,** Oakland, Calif., has been promoted to secretary and treasurer of the corporation, with headquarters at the Oakland plant. He has been connected with the corporation for the last 25 years, most of which has been spent in the southern California area.

—o—

George Gorton III, executive vice president and general manager, **George Gorton Machine Co.,** Racine, Wis., has accepted membership on the American Management Association production council.

—o—

Charles F. Colbert Jr. has been re-elected president and general manager, **Pittsburgh Metallurgical Co.,** Niagara Falls, N. Y., for the 11th consecutive year.

—o—

C. A. Mapp has been appointed district sales representative, and **H. D. Buckner,** service supervisor for diesel locomotives in a diesel locomotive sales and service office opened in Cleveland by **Fairbanks, Morse & Co.,** Chicago. They will be located in the company's branch office, 2810 Superior Ave.

—o—

E. H. Ehlert has been appointed region manager of industrial cleaning equipment and chemical sales for midwestern states by **Detrex Corp.,** Detroit. Mr. Ehlert has been with the company since 1943 and since 1948 has been manager of the Detroit industrial sales office. In his new post he will be stationed in Chicago. **W. J. Miller,** who also joined the firm in 1943, will be in charge of field application of Detrex alkali and emulsion cleaning compounds for the midwestern states.

—o—

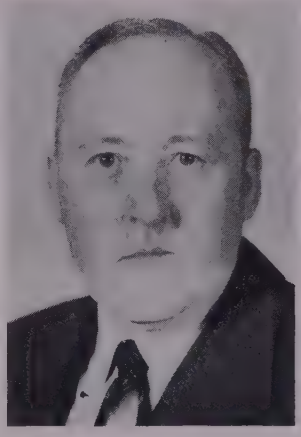
Liquid Plastics Division, **Ferro Enamel Corp.,** Cleveland, announces appointment of **O. P. Taylor** to handle sales of Vedoc organic industrial finishes in northern Ohio and **G. J. O'Roark** to act in a similar capacity in the Chicago area.

—o—

William A. Henderson has been appointed Detroit district sales representative of **Fort Duquesne Steel Co.,** Pittsburgh, and its affiliate, Hamilton Steel Co., Cleveland. Until recently, Mr. Henderson was Detroit representative for Ohio Stainless & Commercial Steel Co. and previously represented Eberhard Mfg. Co. in the Detroit area for 20 years.

—o—

Harold R. Ryan has been transferred



HAROLD R. RYAN

to the Youngstown district as superintendent of the Brier Hill open-hearth department of **Youngstown Sheet & Tube Co.** He succeeds **Paul Johnson** who recently left the company. Mr. Ryan joined Youngstown Sheet & Tube in 1937. In February, 1947 he was appointed a practice engineer in Brier Hill open-hearth, and the following September was transferred to the Indiana Harbor plant, Chicago district, as assistant superintendent of the open-hearth department.

—o—

G. L. Gabrielson has been appointed sales agent in the Pittsburgh office of **American Car & Foundry Co.,** New York. He formerly was in the miscellaneous products division of the company's sales department in New York.

—o—

H. Edward Neale has been appointed Chicago direct representative for **Bullard Co.,** Bridgeport, Conn., working in conjunction with Marshall & Huschart Machinery Co. He takes the place of the late **George York.**

—o—

Wayne Karber has been appointed sales engineer in charge of cast stainless steels by Wm. G. Boales & Associates, Detroit, to handle and coordinate activity concerned with **Cooper Alloy Foundry Co.'s** line of valves, fittings, accessories and engineered castings.

—o—

Arthur Kuiper has been appointed treasurer of **Continental Foundry & Machine Co.,** East Chicago, Ind. Formerly controller, Mr. Kuiper succeeds **W. L. Spencer,** retired.

—o—

Francis J. Sehn has been added to the staff of the Detroit office, **Clearing Machine Corp.,** as a sales engineer. He previously was chief die engineer for Fisher Body Tank Division, General Motors Corp.

—o—

V. C. Dollman has been appointed Pacific Coast sales manager for **Wheeling Steel Corp.,** Wheeling, W. Va. He will make his headquarters in San Francisco. Mr. Dollman, who has been resident sales representative in Indianapolis, replaces **K. P. House** who will come to Wheeling as assistant manager of the pipe division.

—o—

William Pohn, Pohn Iron & Steel Co. Chicago, was re-elected president **Chicago Chapter, Institute of Scrap Iron & Steel Inc.**

—o—

Elmer H. Riddle has been appointed

ELMER H. RIDDLE

superintendent of the blast furnace department, Aliquippa Works, **Jones & Laughlin Steel Corp.,** Pittsburgh. He formerly served as assistant superintendent, and has been associated with the blast furnace department for the last 22 years.

Gerard M. Haley has been appointed

GERARD M. HALEY

director of purchases, **Chevrolet Motor Division,** General Motors Corp., Detroit. Formerly purchasing agent at the Chevrolet central office, he replaces **R. G. Ford,** who was promoted to manager of assembly plants. Six other appointments announced simultaneously are: **E. F. Gormsen,** formerly purchasing agent, Chevrolet gear and axle and forge plants in Detroit, promoted to purchasing agent, central office; **E. J. Furbacher,** assistant purchasing agent, central office, becomes purchasing agent, gear and axle and forge plants; **Milton J. Schemm,** purchasing agent, Chevrolet-Toledo plant, promoted to assistant purchasing agent, central office; **Kenneth V. Daniels,** a divisional buyer, central office, becomes purchasing agent at the Toledo plant; **George B. Ford,** purchasing agent, Chevrolet parts manufacturing plant, Saginaw, Mich., appointed purchasing agent, Saginaw gray iron foundry, succeeding **John M. Hance,** retired; **Carl S. Allemang,** a divisional buyer, central office, promoted to purchasing agent, parts manufacturing plant, Saginaw, succeeding Mr. Ford.

—o—

E. E. Baker has been elected vice president, Public Works Pump Division, **Hamilton-Thomas Corp.,** Hamilton, O., and **W. G. Rosendahl,** as vice president of the Machine Tool Division. Mr. Baker joined Economy Pumps, division of Hamilton-Thomas Corp., in 1945 as manager of distributor sales, and Mr. Rosendahl joined the company as general superintendent in 1941, later serving as assistant manager and then manager of sales of its Liberty Planers Division.

—o—

J. T. Rimer Jr. has been appointed assistant to the president, in charge of industrial and public relations, for **Universal-Cyclops Steel Corp.,** Bridgeville, Pa. He has been associated with the firm since 1943 as director of personnel.

—o—

Ampco Metal Inc., Milwaukee, has appointed **J. A. Arter** as assistant general manager. He joined the company in 1937 and since 1945 has been staff assistant to the general manager.

—o—

Harold H. Keays has been named superintendent of production at the Los Angeles **Lincoln-Mercury** plant, Ford Motor Co. He formerly was superintendent of the trim department at the Detroit Lincoln plant.

Melville Morris has been elected

MELVILLE MORRIS

president of **Optimus Equipment Co.,** Matawan, N. J. He has been executive vice president of the company, which is a subsidiary of Hanson-Van Winkle-Munning Co., also located in Matawan.

—o—

Solar Aircraft Co., San Diego, Calif., announces the following personnel changes: **Earl D. Needham,** formerly assistant purchasing agent at the Des Moines, Iowa, plant, has been promoted to purchasing agent; **Philip L. Ward** has been transferred from the Contract Administration Division, Des Moines plant, to manager, contract administration office, 1025 Connecticut Ave. N. W., Washington; **John W. Parsons** has been transferred from the contract administration office in New York to manager, contract administration office, 120 W. Second St., Dayton, O

OBITUARIES...

Arthur H. Oberndorfer, 62, advertising manager, **Hevi Duty Electric Co.,** Milwaukee, died Oct. 13 while enroute to Cleveland to attend the 31st National Metal Congress & Exposition.

—o—

Paul W. Lyon, manager of market research, **Wheeling Steel Corp.,** Wheeling, W. Va., died Oct. 14 after an illness of several months. He had been associated with Wheeling Steel for 15 years. He had previous association with American Sheet & Tin Plate Co. and Carnegie-Illinois Steel Corp. Mr. Lyon joined the tin plate sales division of Wheeling Steel in 1934 and in 1943 assumed duties in war relations and became manager of market research for the corporation.

—o—

John H. Brown, 35, personnel manager and a director of **Brown-Boggs Foundry & Machine Co. Ltd.,** Hamilton, Ont., died Oct. 9.

—o—

George A. Cardwell, 67, manager, alloy sales, **Lukens Steel Co.,** Coatesville, Pa., died Oct. 13. He had been associated with Lukens since 1927 when he joined the company as a salesman. He was named manager of alloy sales in 1932.

—o—

August J. Marohn, former owner of **Albany Wire Works,** Albany, N. Y., died Oct. 9. He operated the wire works for 38 years until he retired in 1929.

—o—

William H. Taylor, 61, Adrian, Mich., western division sales manager of **Toledo Steel Products Co.,** Toledo, O., died Oct. 7 from injuries received Sept. 19 when he was struck by a bus in Dallas while on a business trip. He had been associated with the steel firm 25 years.

—o—

Harry P. Jenson, 64, associated with **Cleveland Twist Drill Co.,** Cleveland, for 44 years, died Oct. 17. He held the positions of assistant manager of sales and export sales manager of the company.

—o—

Herbert H. Leader, 55, development engineer and manufacturer, died Oct. 2 in Rochester, N. Y. He formerly was chief engineer for **F. A. Smith Mfg. Co.** and also was associated with **Weber Machine Corp.**

—o—

Arthur S. Bland, 68, retired sales engineer, **Mississippi Valley Structural Steel Co.,** Decatur, Ill., died Oct. 16 in St. Louis. He had been in retirement for the last three years because of illness.

WHEN YOU USE

AMERICAN WELDING

"Controlled Technique"

YOUR PRODUCTS HAVE THESE ADVANTAGES

1. Insured Conformity to Specifications
2. Lower Cost
3. Closer Tolerances
4. Less Machining
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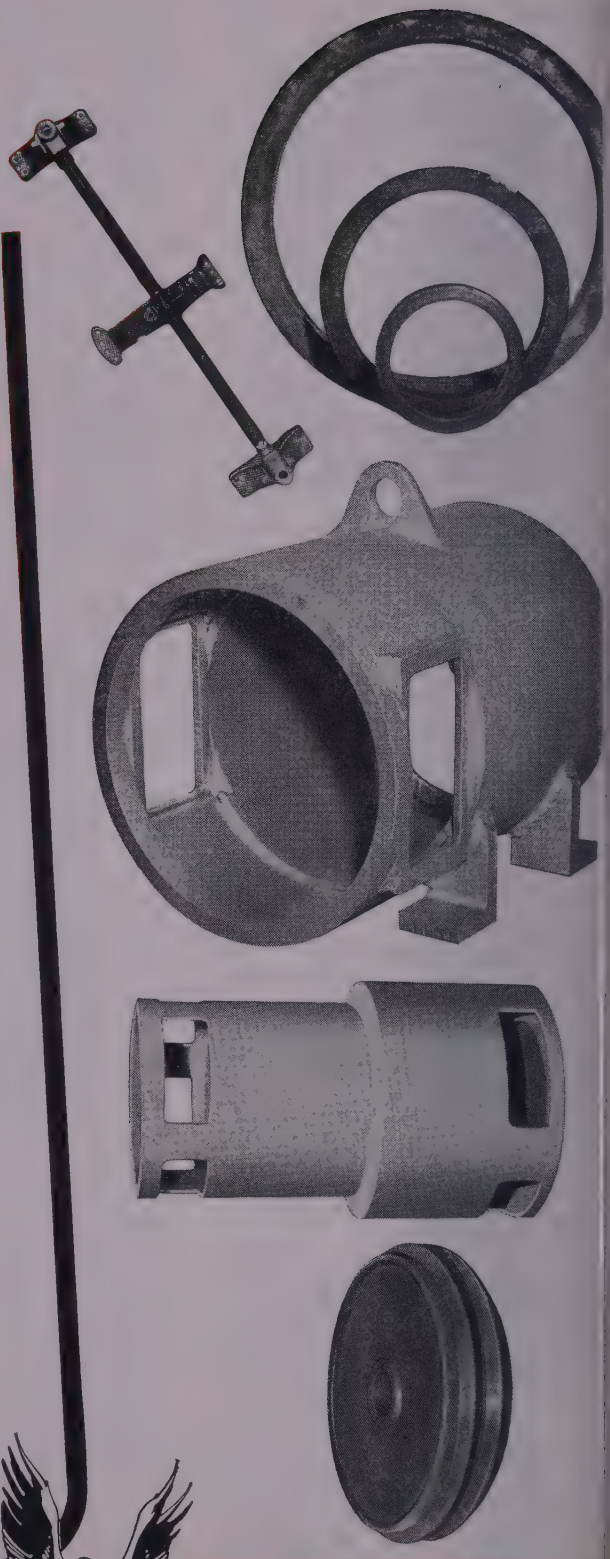


PRODUCTS MANUFACTURED BY A TYPES OF RESISTANCE AND FUSION WELDING

THE AMERICAN WELDING & MANUFACTURING CO. • WARREN, OHIO

110 DIETZ ROAD

Engineering News . . . AT A GLANCE

CUTS PRODUCTION STEPS—Metal products can be given a bright, reflective surface without mechanical or electrical operations by a new process developed by Battelle Memorial Institute, Columbus. Referred to as chemical polishing, the method eliminates as many as four or five production steps in finishing a metallic product. Work involved consists merely of dipping the product to be finished into a solution and withdrawing it a few minutes later—polished to a mirror-like luster. Process is especially advantageous in polishing items of intricate form. Also surface obtained may serve as a base for subsequent plating. Brass, copper, nickel-silver, Monel, nickel and aluminum may be polished successfully by the method.

ATOMS FOR TRACING RUST— Radioactivity may be the answer in learning how to control common rust. In experiments using radioactive tracers General Electric engineers in Schenectady, N. Y., discovered a method that reveals photographically how and where rust starts and how deep it goes. Technique involves electroplating a solution holding radioactive iron on the surface of the metal then placing a photographic plate against this surface leaving it thus several days. During this time an x-ray exposure is made on the plate by the radioactive coating. As the test piece rusts, a decrease in radiation results, showing up graphically as lighter areas on the photographic plate. A series of these "autoradiographs" shows nature of the rust forming.

COST-REDUCING PROCESS— Karat gold now can be rolled to a mirror finish and as thin as electroplate on any nonferrous metal base by a process developed by American Silver Co. Inc., Flushing, N. Y. Method avoids use of expensive polishing and electroplating operations after fabrication usually required to achieve the gold color. Essentially, process consists of welding the gold layer to a barrier layer of pure nickel, then soldering the dual thickness to the base metal in the conventional manner. By welding and introducing the barrier layer of metal, "bleeding" is overcome completely. Development is expected to cut manufacturing costs of fountain pens, watch cases and bands, buckles and many optical items.

PROVIDES QUICK ANALYSIS—New sensitive test method of making hydrogen analysis in steels is expected to lead to more efficiently controlled qualities in the metal, according to the Office of Naval Research. Amount of hydrogen in a melt of steel can be checked in about 15 minutes by the technique.

SPEEDS UP DRILLING— Drilling of multiple holes in various types and sizes of steel plates and housings is greatly simplified by making use of an adjustable index table with a vertical boring mill at the Sunnyvale, Calif., plant of Westinghouse Electric Corp. Work is speeded up some 60 per cent as, once the setup is made, any number of subsequent operations may be repeated on both sides of the piece. Operation is basically simple: Jig containing the piece is placed on the pre-indexed table which turns on a vertical plane. Drill head is quickly placed in position for any number of holes desired on the top surface. When this surface is finished, jig and piece inside it can be "flopped" in a few seconds with the aid of a hoist.

NEW ROD MILL—Installation of a new rod mill at Colorado Fuel & Iron Corp.'s Minnequa Works at Pueblo, Colo., increases the company's former rod capacity more than 65,000 net tons annually. The latest facilities roll, in 27 passes, 4⅜-inch square billets into finished coiled rods in form of 700-pound bundles. (p. 58)

ENFORCED CONTROL—In producing bronze bearings in the Allison Division of General Motors, Indianapolis, careful control is enforced on all melting and casting operations. Highest grade metals are used for all bronze melting. Pouring is done directly from crucible into the welded steel flask assembly. This permits closer control of metal temperature. Alloys employed are subject to segregation if the temperature is permitted to fall 50° F below the optimum pouring temperature before quenching. (p. 61)

INSPECTION PLUS—Because of the close tolerances required and the commercial use of a forged part, inspection of precision-forged turbine blades and buckets cannot be stressed too highly. To insure quality control, five major steps are employed in the inspection procedure at Steel Improvement & Forge Co., Cleveland. These include: Preparatory layout and engineering, die forge, hardness and final inspections. On some compressor blades currently used in Air Force fighters, preparatory layout and inspection procedure involves as many as 11 different sectional layouts. (p. 66)

LARGE SCALE DELIVERY— One of the most interesting, potentially valuable contributions to the art of making seamless pipe is the so-called "continuous-tube rolling mill." Essentially, it is similar to a modern strip mill so far as processing the product is concerned. Its use is considerable in both this country and Europe, but nowhere on as substantial a scale as one now being constructed by National Tube Co. This unit is designed to deliver pipe 65 feet long in sizes 2 to 4½ inches at rates up to 900 feet per minute out of the last stand of rolls. After further processing in a stretch reducing mill, lengths up to 400 feet and delivery rates as high as 2200 feet per minute are expected to be attained. (p. 68)

NEW ROD MILL

To Increase Production

At Colorado Fuel and Iron Corp.

Nearly 50 years of rod making "know how" is combined in the new facilities recently placed in production at the company's Pueblo plant. Operators believe their $5 million mill is among the most modern units of its type in the country

INCREASED production of coiled rod in 700-pound bundles is being afforded Colorado Fuel and Iron Corp. with the installation of the new rod mill at their Minnequa Works at Pueblo, Colo. Replacing a Garrett mill installed in 1903, the new rod rolling facilities will increase the company's former rod capacity more than 65,000 net tons annually.

The new mill will roll from 4⅜-inch square billets through 27 passes into finished coiled rods. Four of the 27 stands will break the square billets down to a 2½-inch square, after which they will pass through a 23-stand Morgan rod mill proper of more or less present-day conventional type.

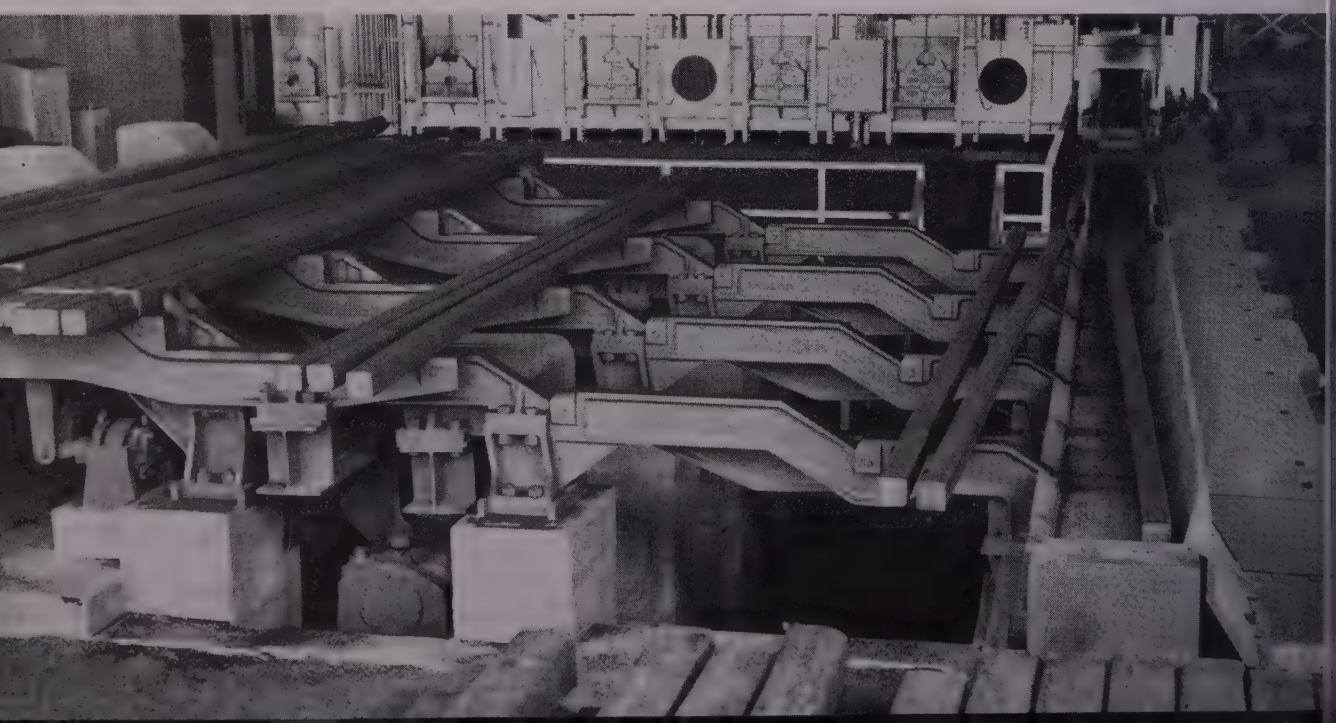
The initial billets will be rolled in the existing rail mill, sawed into approximately 22-foot lengths and passed over cooling beds where the temperature will be reduced to approximately 700° F and delivered to a heavy-section billet yard operated in conjunction with the finishing end of the rail mill. Here they will be handled by a 12½-ton overhead magnet crane and loaded either directly into special billet cars or stored in a billet yard at that location and later transported by billet cars to the rod mill.

Bundles of rods, ranging from No. 5 gage up to and including ⅜-inch diameter, will be delivered from the mill to six laying reels, which, in turn, will deliver the bundles to two flat conveyors—three reels serving each conveyor. Sections heavier than ⅜-inch diameter will be delivered to heavy type pouring reels and delivered to an extension of one of the flat conveyors. The mill will handle all sizes from No. 5 rod up to and including 1¼-inch rounds.

From the flat conveyors the bundles will be carried by hook conveyors, 1400 feet long, having approximately 900 feet of effective cooling length to an unloading station where they will be loaded onto an electrically operated shuttle car system, which will transport them in carload lots to the wire mill docks or to the wire mill cleaning house direct, as required.

Novel Billet Handling—The combined billet yard and furnace building has a span of approximately 96 feet and is 250 feet total length. Of this length, 125 feet is shared by the furnace building and part

Fig. 1—First machine ever built for the unscrambling of billet loads. As much as 27 tons can be handled by the unit which also straightens the material and shuffles it to the furnace charging table. No labor is required at the machine, thus eliminating a hazardous occupation



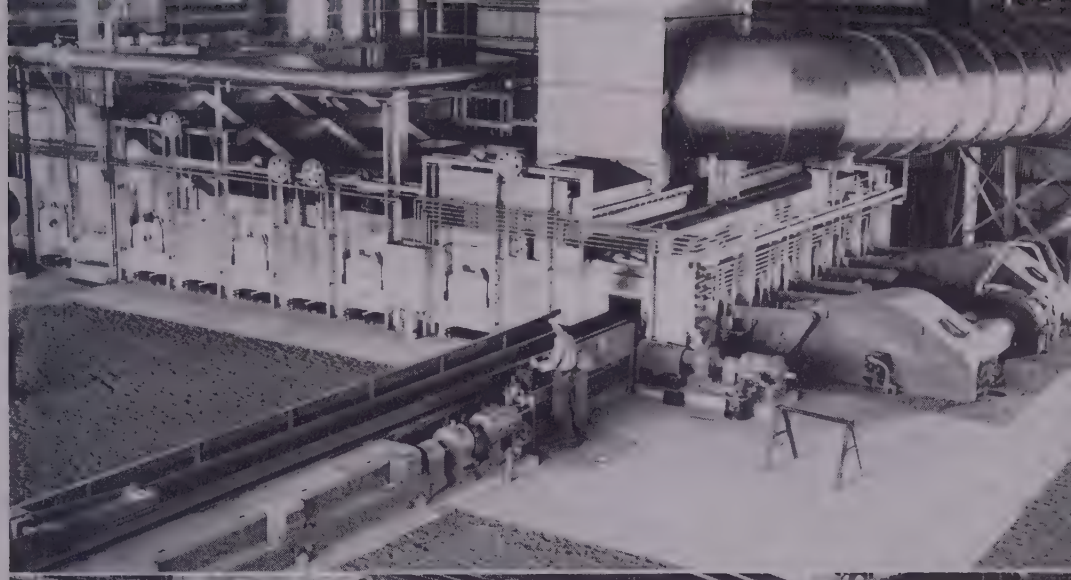


Fig. 2 — Entry end of heating furnace which can handle 60 tons of billets hourly. It has a hearth 26 x 69 feet long

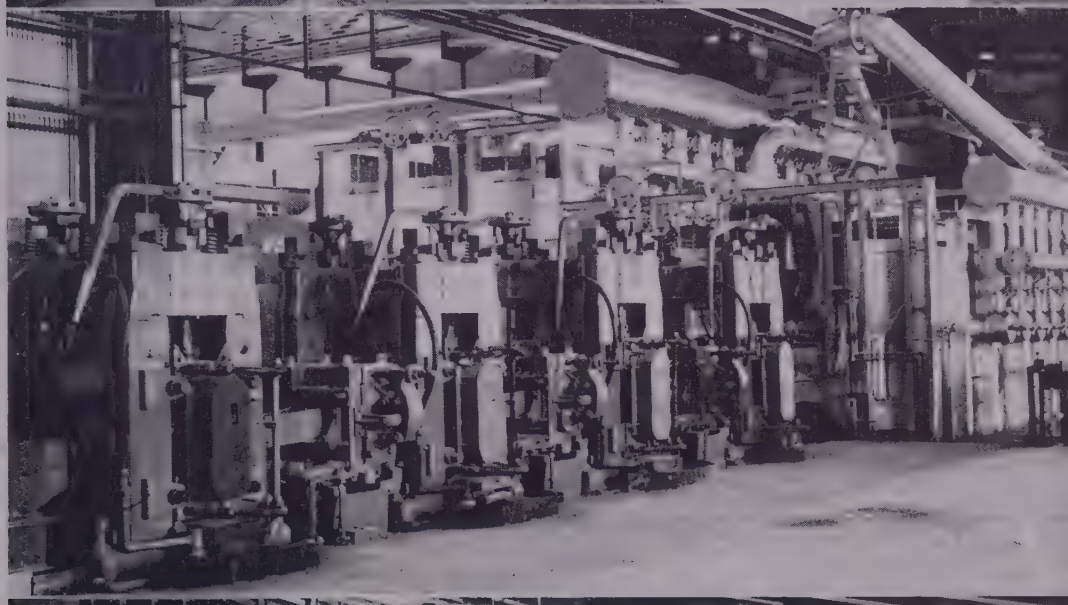


Fig. 3 — Single strand four-stand breakdown mill which takes the billets down to 2½-inch squares and larger prior to entering the holding furnace

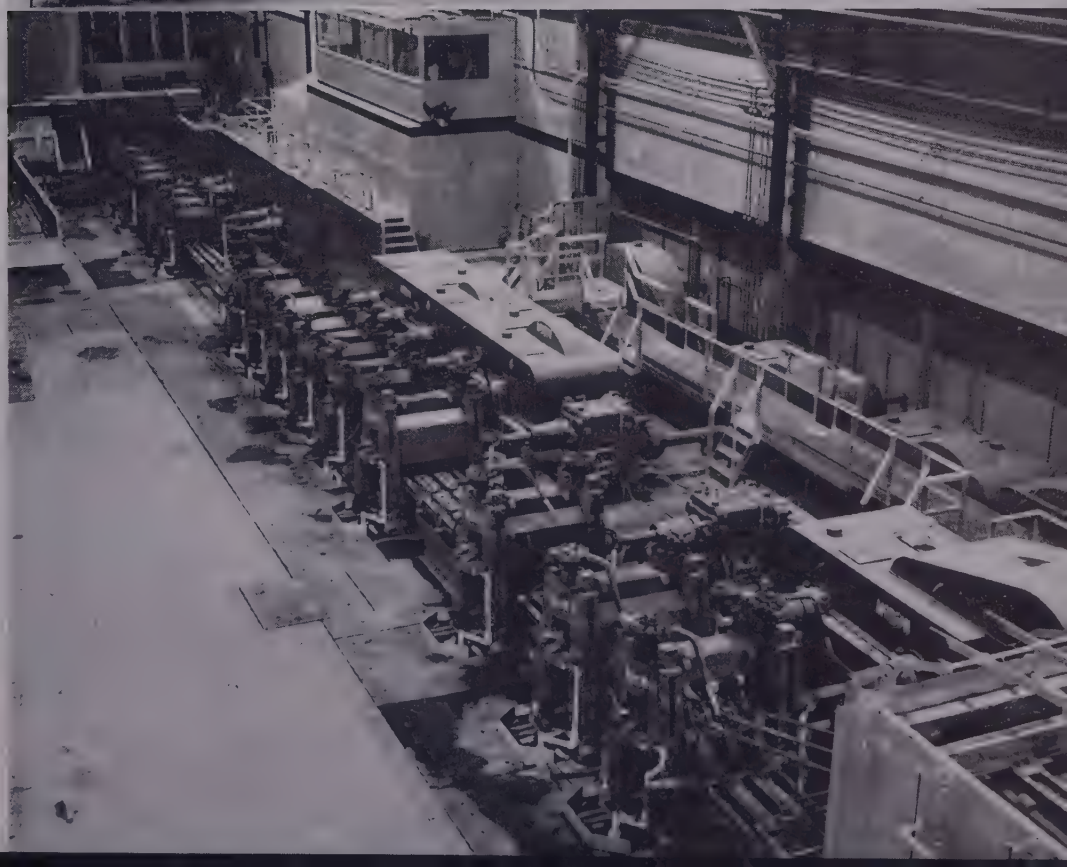


Fig. 4—View of end of holding furnace and rod mill proper. Three strands of rod travel simultaneously through these stands at an estimated speed of 156 miles per hour

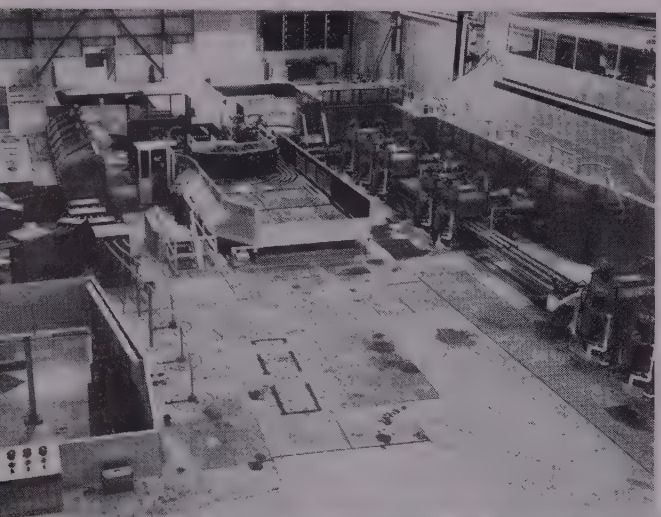
of the billet yard. A 15-ton Cleveland magnet crane serves the entire area. Billets from special billet handling cars will be lifted from the cars and placed into storage racks or taken directly to a billet arranging machine. Storage space has capacity for approximately 8000 tons of billets. The billet arranging machine, furnished by the Morgan Construction Co., is the first of its kind to have been built. Billet lifts of approximately 9 tons up to a total of 27 tons comprising approximately a 45-minute supply reservoir, may be deposited at a time on the machine which will transfer the billets sideways to the furnace charging table. Should the billets, for any reason become out of line, they will be put in to alignment by the machine and then shuffled to the furnace charging table. This machine is operated by the furnace charging man from a control station at the furnace charging station. No labor is required.

The furnace, which is of the double combustion zone type, was designed, fabricated and erected by the Rust Furnace Co. It is side charge, side discharge type. All furnace charging equipment was furnished by Morgan. The furnace has a rated capacity of 60 tons per hour, and the hearth is 69 feet, 8½ inches long by 26 feet wide, including the soaking zone at the discharge end. The furnace is operated with full automatic control.

Billets from the furnace are delivered to a single-strand Morgan continuous breakdown billet mill, comprising four stands which reduce the billet to 2½-inch square, plus or minus as required.

Leaving the breakdown mill the billet is received on a holding furnace charging table where it is divided into two 34-foot lengths before entering the furnace, which has a 6-foot hearth and is 37 feet wide. It was designed by Morgan and fabricated and erected by Colorado Fuel and Iron Corp. This furnace not only controls temperature of the billet from end to end as desired, but also serves as a billet reservoir in front of the rod mill proper, which generally is of the modern conventional Morgan type comprising nine continuous roughing stands.

Following the ninth stand is located a crop shear where the length of the crop to be cut is automatically determined. Following and also in line with the roughing mill there are five (*Please turn to Page* 82)



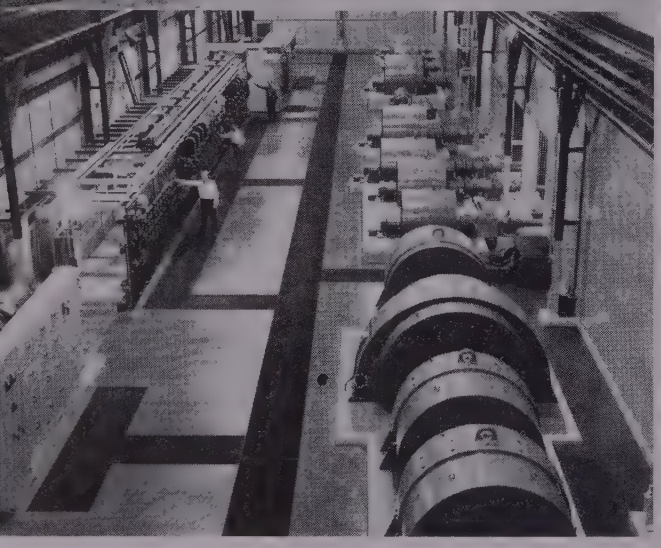
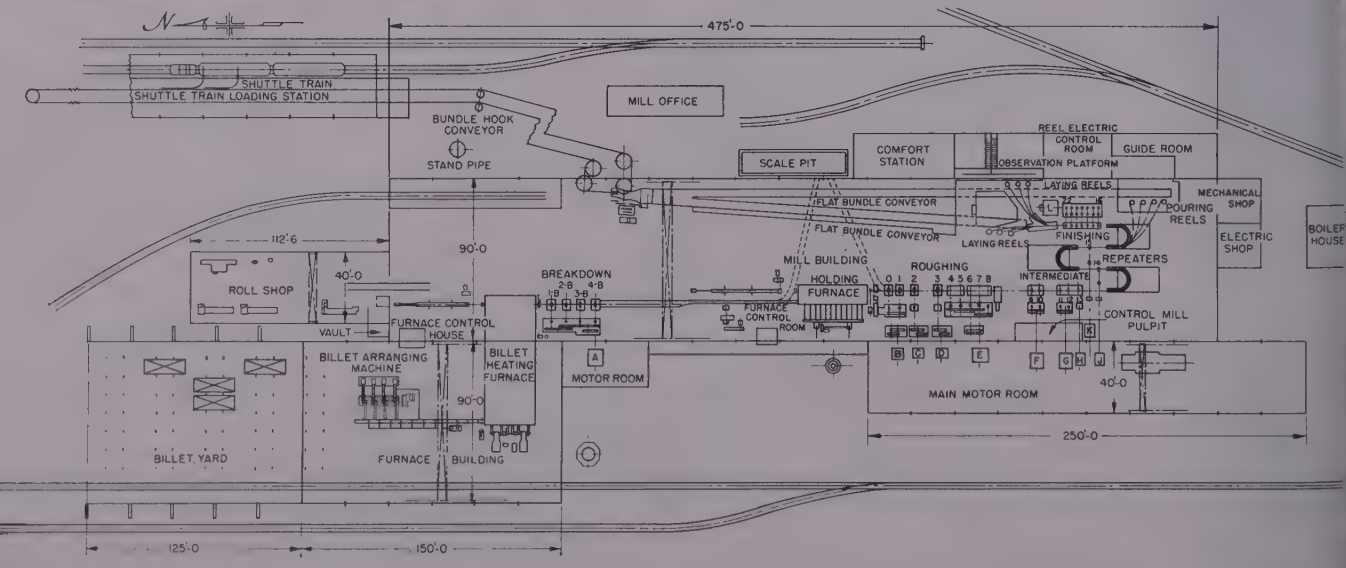


Fig. 5—(*top*) *Control pulpit is at right and delivery tubes which carry the material from last finishing stand to coilers are seen in center, behind is seen the repeating arrangement*

Fig. 6—(*center*) *Motor room which is kept under positive pressure with the basement under partial vacuum in order to circulate air through the mill motors*

Fig. 7—(*below*) *General plan of new rod mill*



SLEEVE BEARING PRODUCTION...

Involves Unusual Casting and Machining Procedures

Fig. 1—Pouring molten bronze from induction melting furnace into a steel flask supported in a pot in which the flask containing a steel sleeve was previously heated. Bronze bonds to sleeve and flask in quenching

By HERBERT CHASE

HIGH precision methods employed by the bearing plant of Allison Division, General Motors Corp., Indianapolis, in the manufacture of sleeve type bearings were extended during the war to the production of millions of aircraft engine bearings. These same precision practices which were developed over a period of more than 25 years continue to be used in the processing of much larger bearings used in diesel engines. Some of these bearings used in diesel locomotives are reported to have seen service in excess of 2 million miles, and were still found in serviceable condition when dismantled for inspection.

Production methods used in casting and machining these bronze bearings are unusual and in some respects are unique. A portion of the production is made with bronze layers bonded to both sides of the low carbon steel backings. It is possible to make these bronze layers of different compositions, if desired. This type of construction is often found necessary in the connecting rod construction used for V-type engines, with both forked and blade type connecting rods used on the same crankshaft journal. Because of the low rubbing speed of the blade connecting rod on the outer bronze coating, the outer bronze may be harder than the inner bronze which aids in the long life experienced with many of these bearings.

Allison Division bearing plant can cast any bronze composition suitable for bearing applications. In recent years, however, some of the compositions pioneered by the company have been standardized by engineering groups such as the Society of Automotive Engineers. These standard compositions form a large part of the material cast at the present time. Typical compositions used are 25 per cent lead, 3 per cent tin, 72 per cent copper, and 15 per cent lead, 10 per cent tin, 75 per cent copper. The tin contents in the bronze are commonly reduced for use with crankshafts or other journal surfaces which are not hardened.

High Grade Metals Used—A careful control is enforced on all melting and casting operations. The highest grade metals are used for all bronze melting, with some of the melts being made up from the individual components and others from material purchased in the form of ingots made to specifications desired.

All melting is done in electrothermic induction furnaces using clay graphite crucibles such as shown in Fig. 1. Pouring is done directly from the crucible into the welded steel flask assembly. Direct pouring is used because it permits a closer control of metal temperature. Alloys used are subject to segregation if the temperature is permitted to fall 50° F below the optimum pouring temperature, before quenching. For diesel bearings, most of which are

two to three times larger than average aircraft engine bearings, three to five bearings are commonly poured per heat.

Steel sleeves used as bearing backings are machined close to size, then ground both inside and outside. While the grinding is done primarily to permit holding accurate sizes on the steel surfaces underlying the bronze, it also provides an excellent surface for bonding the bearing metal.

Steel flasks are used because they are moderate in cost, provide annular recesses in which to pour bronze in concentric layers of desired thickness and aid in the rapid quenching that is necessary to yield the desired grain structure.

Outer Walls Stepped—Shells forming flask walls are drawn from sheet steel 0.060-inch thick and each has an outward flange when forming the inner wall of the flask or an inward flange in the case of outer flask walls. When both are used with steel sleeves that are to receive bronze on both sides, the outside and inside diameters of the respective flanges are trimmed so that they fit each other. Inner flask walls are true cylinders but outer walls are stepped in such a way as to provide decreased thickness toward the bottom of the flask. This change in thickness affects the cooling rate after casting the bronze and is provided to insure the desired shrinkage rate in quenching. The flasks are expendable, being machined away on the first turning and boring operations performed on the cast assembly.

To keep the flask parts in correct relative location both to each other and to the sleeve, the flask cup or cups are welded to the sleeve. After welding, the flask is ready to go to the furnace where heating is done before pouring.

Before heating, however, the welded assemblies (whose components are well cleaned before being welded) are filled with a granular flux which melts and cleans the steel surfaces as heating progresses. The liquid flux remains in the assembly until, during pouring, it is displaced by the liquid bronze. This procedure keeps the steel surfaces from oxidizing and insures the perfect bond with the steel backing that is essential for a good steel backed bearing.

For heating, each flask is placed in a covered pot made from a heat resisting alloy and remains in this pot until the heating and casting is completed. As casting proceeds (Fig. 1) the flux displaced overflows into the pot and is recovered. Use of pots is convenient and also helps to keep the bronze above the segregation temperature until the casting, still in the flask, is quenched. This quench immediately follows the removal of the flask from the pot.

Water or Oil Quench—Quenching is a highly important step in the processing and is done in special machines, one of which appears in Fig. 2. For heavy bearings, the quench is water, but oil is sometimes used for lighter bearings. In both cases, the temperature of the quenching medium is held within close limits and the quench medium is applied by spraying radially inward from a surrounding tube. As quenching is done, the flask is rotated and is lowered slowly in such a way that progressive solidification at the desired rate occurs. This rate is positively controlled and is varied to suit the size and weight of bearing, as well as to control shrinkage.

When quenching is complete, the flasks are elevated and removed and are ready for transfer to machining. In the latter, since the flasks are bonded to the bronze, they have to be cut away, this being done by boring and, in the case of sleeves with bronze outside as well as inside, by turning also. The bottom of the flask also is cut off and both ends of the bearing are faced and often are chamfered. These operations expose the bronze on the ends and also on the surface of surfaces that, when further machined, become the bearing surfaces.

Bearings that are to be split are cut longitudinally into two halves in a milling operation after rough machining of the bore and ends. The milling cut make the inner and outer surfaces slightly less than half-cylindrical. To produce full half cylinders by making up for the thickness of the milling cuts, the forming operation is performed in a large hydraulic press setup, Fig. 3.

In this operation, the outer diameter of the steel backing is forced into a hardened steel die and sufficient pressure is applied to exceed the elastic limit of the half sleeve. Actually, the pressure is about 70,000 pounds per square inch of projected area and

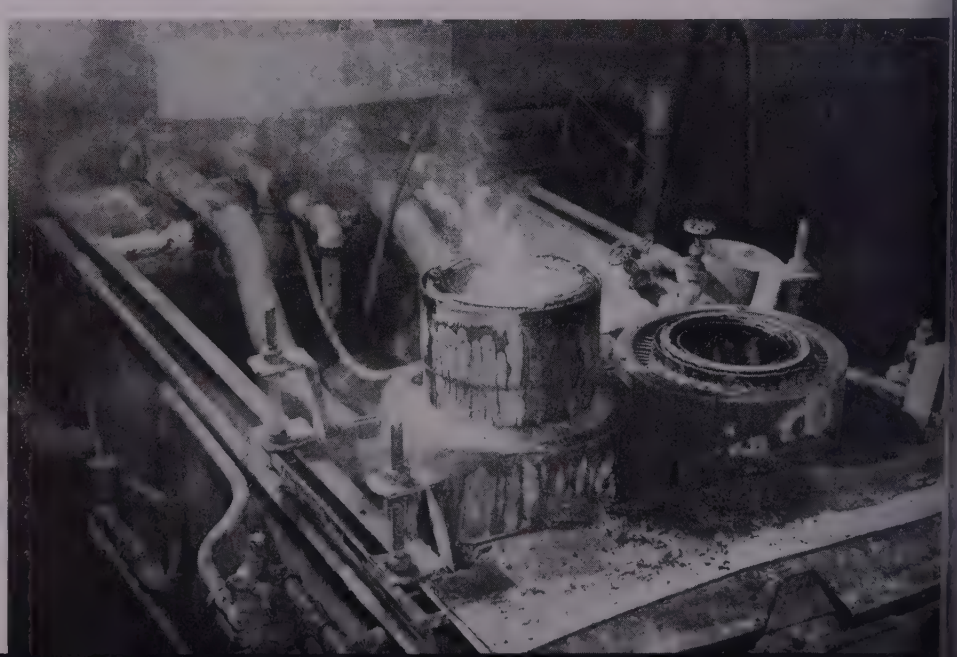


Fig. 2—Machine in which steel flasks and bronze in their annular recesses are quenched in water or oil sprayed radially against outer surfaces as flask is slowly lowered into quenching tube

sufficient to effect some coining or at least enough ermanent set to make the outer surface of the bear- g a part cylinder of smaller diameter than before. his half sleeve has to be somewhat more than a ll half cylinder because the longitudinal surfaces, here the prior milling cut was made, have to be ced in a shaper and later are found to hold close mensional limits.

Finish Turning—The semifinish cut on the bronze ore is made on the half bearing in a precision oring machine, using a carbide tool. After the aper cut on the split faces, two half bearings are amped on an arbor to finish turn the outer diam- er of the sleeve. This is followed by grinding the same arbor in an external grinder. Then ch half goes to a surface grinder for final finish the split face. This is done in a fixture that lo- tes on outer diameter and clamps on inner diameter. Height in this grinding has to be held within plus minus 0.0005-inch or less on many bearings. This ecessitates a special checking fixture, Fig. 4, in hich the bearing is clamped in the cylindrical re- ss of a heavy half sleeve that fits the outer diam- eter and rests above on needle bearings that permit this half sleeve to rock. The fixture is in a press that applies a load equal to bearing capacity, say 14,000 pounds, exerted by a block that bears on the bearing split face. Measurements are made by dial gages from the face of the block to the face of the joint. Parallelism of the split faces in reference to the bore axis is also checked.

Final machining of the bearing bore is done in a precision boring machine using a single-point carbide tool for bronze surfaces. The surface produced in this bore must have a finish not exceeding 20 microinches, root mean square.

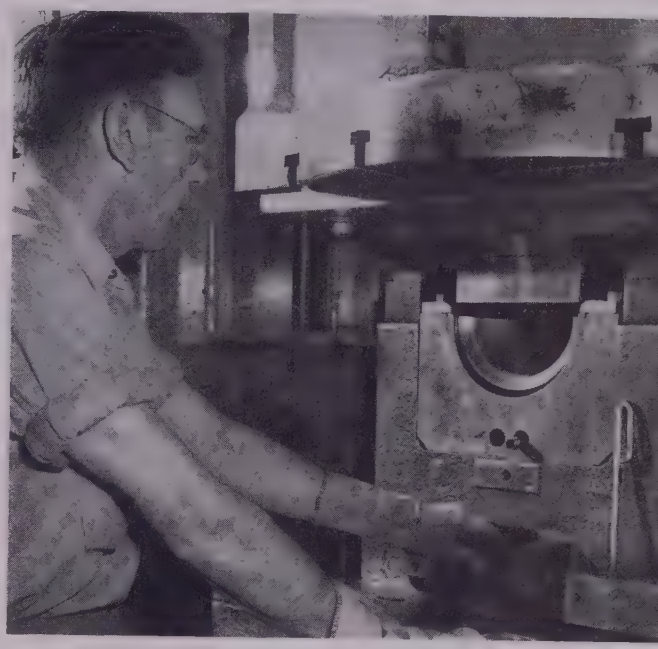
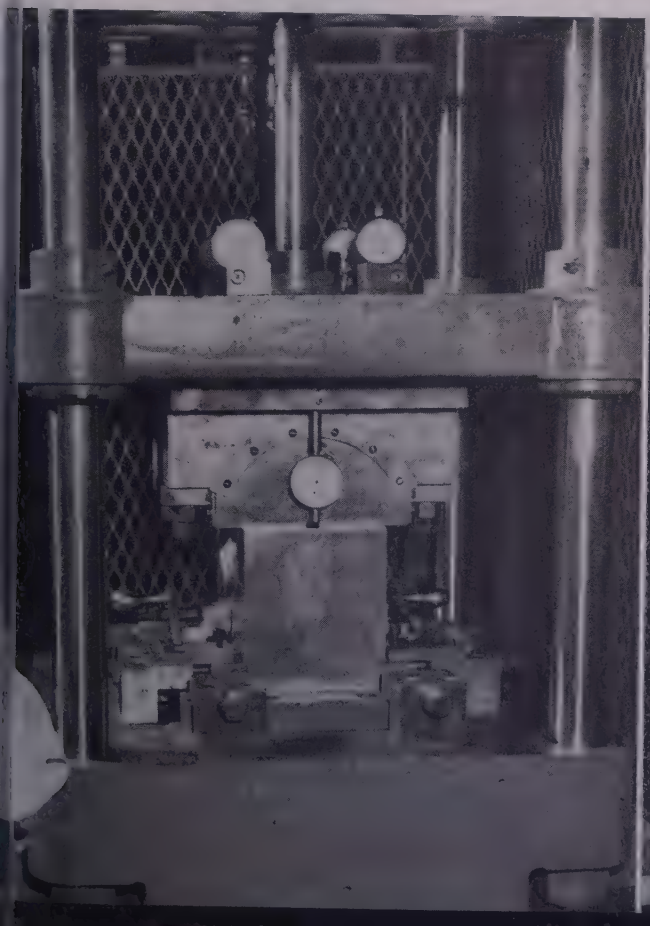
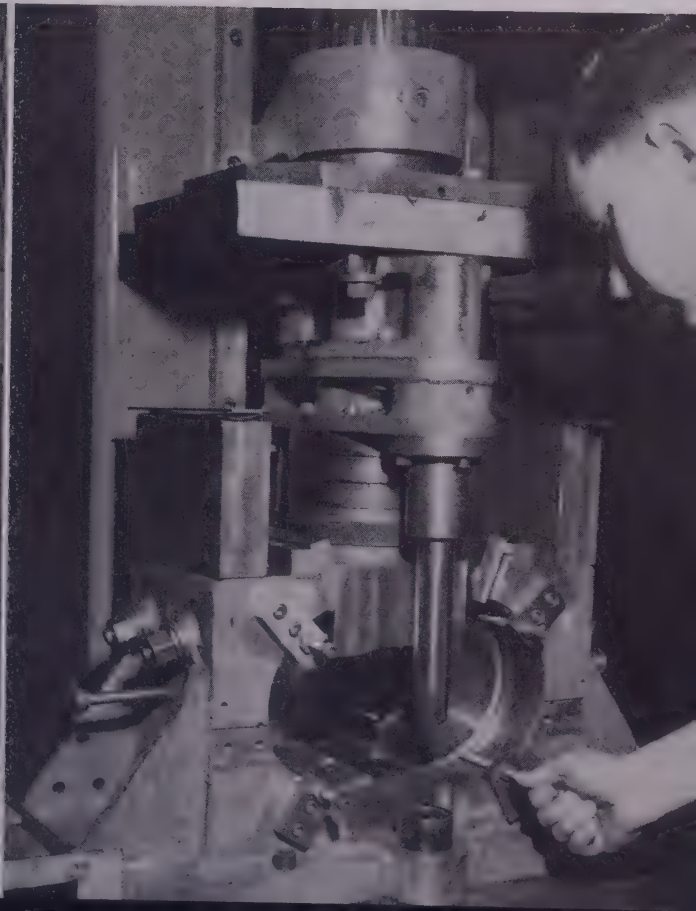


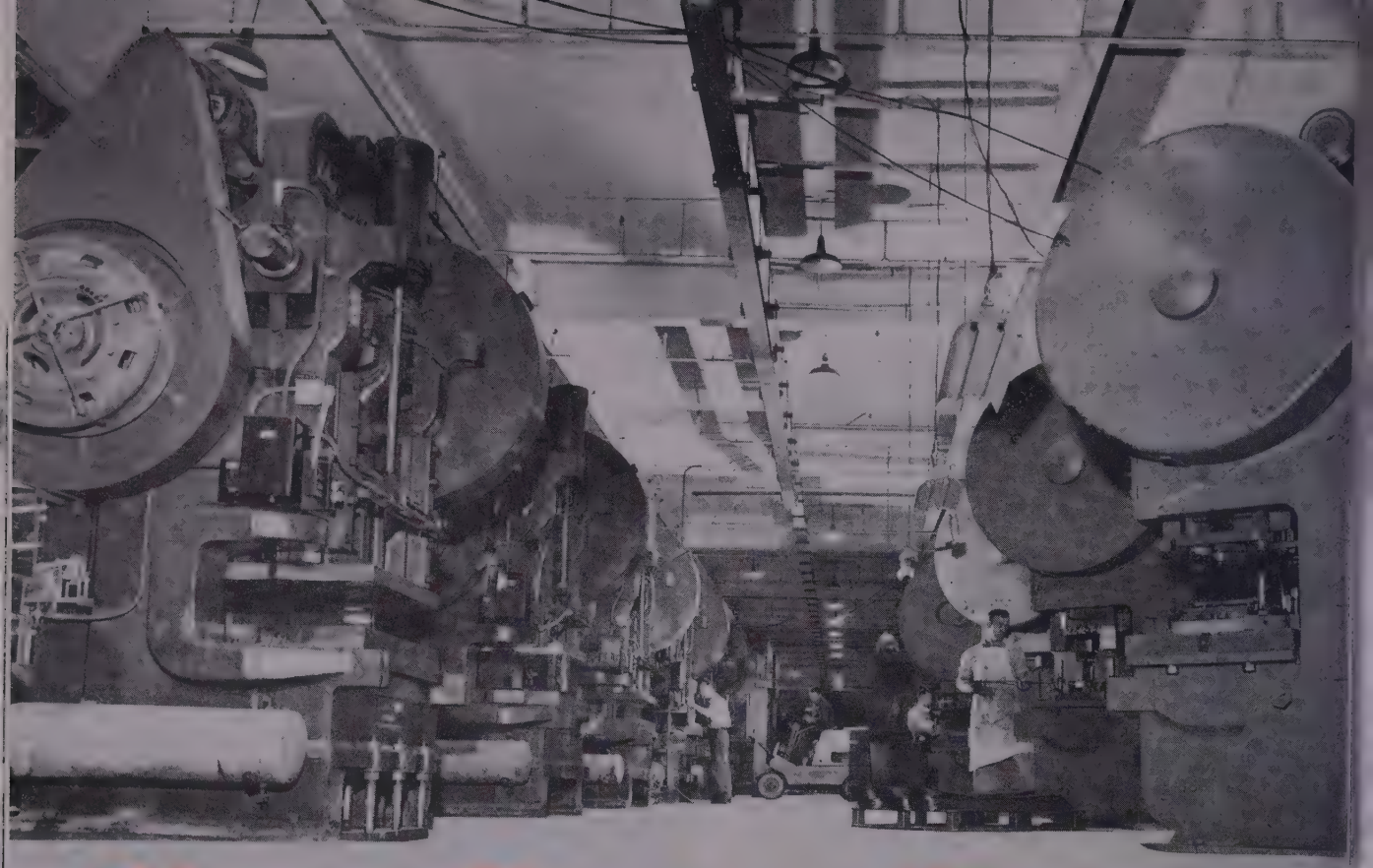
Fig. 3 (right)—Press in which half bearing of bronze bonded to a steel sleeve is shaped to die contour under pressure sufficient to produce a fixed set. Later, split faces are machined to produce a perfect half bearing with semicylindrical diameters

Fig. 4 (below)—Special fixture in which half bearings are precisely gaged while clamped under maximum pressure for which bearing is designed against a half shell that is free to rock on needle bearings. Height is held within plus or minus 0.0005-inch or closer limits

Fig 5 (below right)—Hydraulic press with special fixture used to punch locking tang in side of a large diesel bearing







MASS PRESS-FORMING

Figures Prominently in Steel House Production

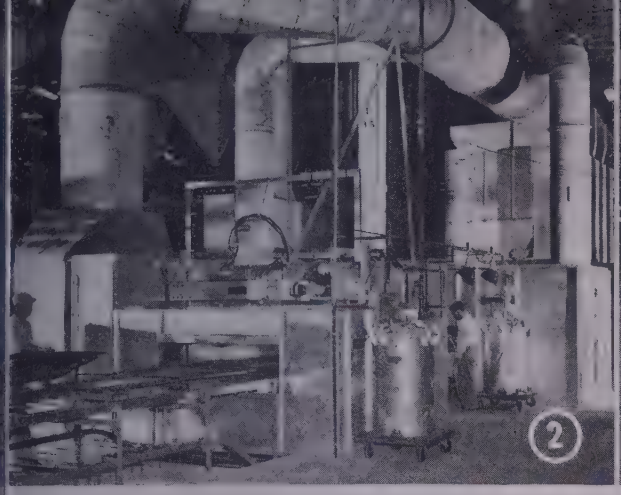
WHEN production facilities of Lustron Corp.'s main building—a total of 1,100,000 square feet—can be brought up to full schedule, the Columbus, O., steel home fabricating concern, will be able to turn out an estimated 30,000 homes per year or about 100 units per day. At that rate, it would mean some 1200 tons of 20 gage, SAE 1008 steel will be needed to make multiples of the 126 different section parts that go to make up a complete house. This does not take into account structural parts of heavier steel.

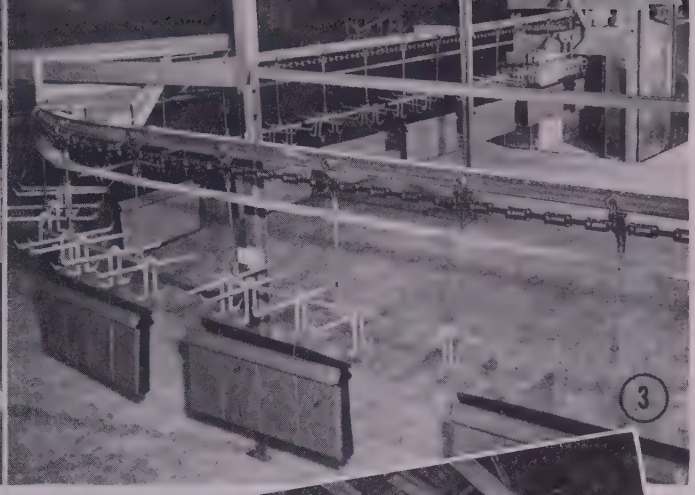
To mass-produce homes at this projected rate, the plant production sequence is laid out in a continuous line served by 9 miles of conveying equipment. Actually, however, production is divided into two main phases—forming of many required sections and porcelain enamel finishing.

Battery of 163 Presses—Forming is done in a separate department where presses of various sizes are grouped together with other forming and welding equipment. Here, steel is received in either sheet or coil form in widths to meet requirements of the particular piece to be fabricated, and moved directly to the shear and presses. A battery of 163 presses, ranging i size from 15 to 1800 tons, is used to stamp out co stituent components. All presses are semiautomat and for many parts that require more than one pre operation, the units are of the multistage progressiv die type.

In fabricating the many 2 x 2-foot exterior panel for example, one 4-stage press does a blanking, form ing, crimping and piercing operation from a co tinuously fed strip of steel. Bath tubs are forme in five operations, one of them being the initial form ing consisting of a single draw. Structural sectio of the houses include many standard parts, principa ly formed sections and gussets. Coil steel stoc is used and 8 to 12-station rolls shape the variou sections. The structural parts are welded at five wel ing stations. Three of these are employed for joinin wall sections and two for truss units.

Preparing the steel components for various finish requires several operations. Structural members a





onderized to protect them from corrosion. They hen go through a flow-coat paint booth, and on to gas-fired drying oven. Plant equipment to handle his work through bonderizing, painting and drying epresents one of the largest installations of its ind in the country, handling work 17 feet in height nd 8 feet in length. From the drier, the sections come ut with a hard, bright black finish that meets all ccelerated weathering tests.

Other formed parts, exterior and interior panels, abinets and sanitary ware are cleaned by pickling. 'rocess consists of hot emulsion cleaning, rinsing, hot lkaline cleaning, rinsing, hot sulphuric acid pickling, insing and hot nickel flashing in that order—fol- owed by hot cyanide and borax neutralizing and ot air drying. Although common method of pickling s by the dip method, Lustron finds the spray method dvantageous in this instance.

While all finishing equipment is in the same gen- ral plant area, certain driers and enameling furnaces re set up for the different finishes. Thirty-six ovens nd furnaces located on conveyor lines are employed or the work. Two of these are electric and the re- aining 34 are all gas units.

Ever since it was discovered that the inclusion of heavier coat of nickel on the cleaned cold-rolled teel produced an excellent finish, application of orcelain enamel to exterior and interior panels has een a one-coat proposition. Most of the enameling s done by spraying, both hand and automatic or by mploying a combination of the two. Base coats on ex- erior panels are applied by dipping or slushing, de- ending on the size of the part.

Enameled parts are processed through the firing urnaces at a temperature of 1300° F to prevent steel arpage. Because different parts requiring different namels are segregated by respective conveyor lines, nany similar drying ovens and firing furnaces are ound in the plant. This enables the company to proc- ss different home components at one time so that complete set of parts for one house comes off the nes at about the same time ready for "packaging."

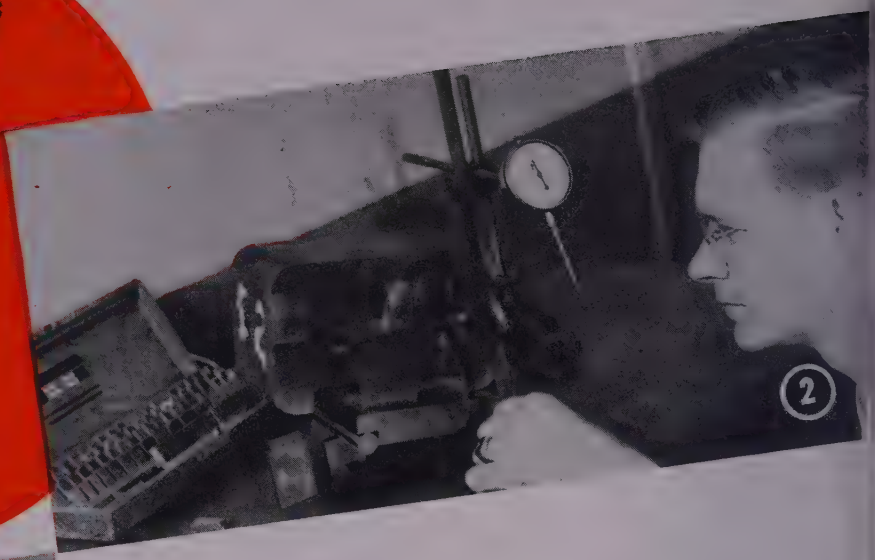
Fig. 1—Sectional glimpse of press department showing double row of forming presses employed to process exterior and interior panels for the Lustron home. Battery of 163 presses shapes many parts required

Fig. 2—Following production-line application of enamel in automatic spray booths, parts proceed directly into furnaces such as this one for firing

Fig. 3—Exterior panels with finished ground coat emerging from a gas-fired furnace where, at 1300° F, the finish becomes porcelain enamel. Company employs six such units, each capable of handling 19,000 pounds of ware per hour

Fig. 4—Medium size 600-ton press here is used to form architectural parts such as exterior corners and roofing panels. Largest press in the department is an 1800-ton unit

Inspecting Forged Turbine Blades and Buckets



Quality control procedures necessary to meet extremely close tolerances involve the use of precision techniques from preparatory layout and engineering through final inspection

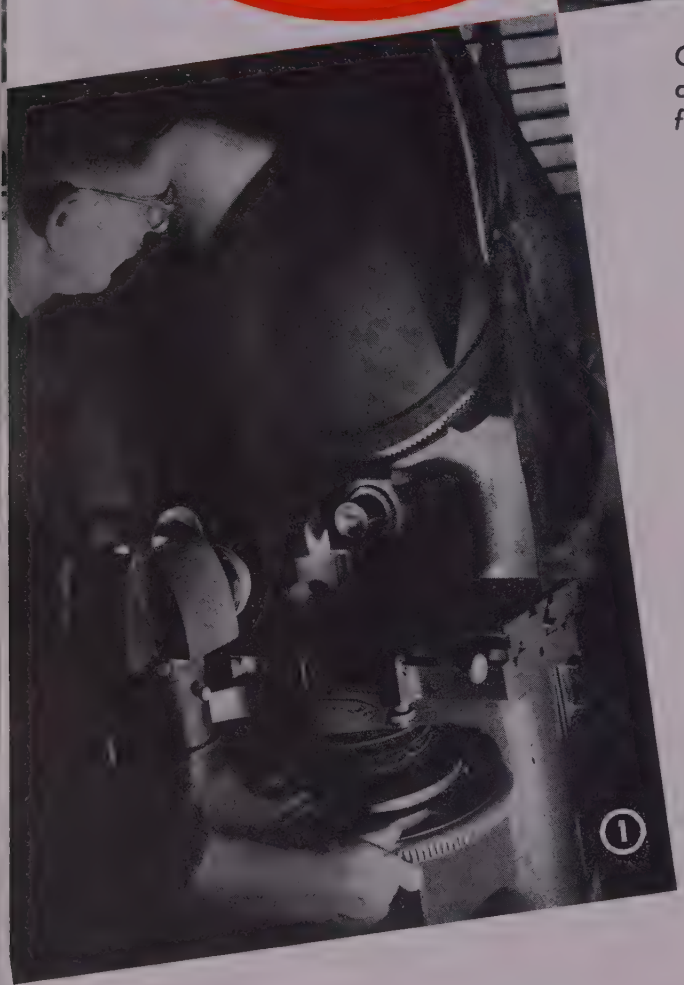


Fig. 1—Die templates for precision turbine forgings are carefully checked by ten times size images on a comparator

Fig. 2—Close inspection of the finished dies before release to the forge shop insures conformity to drawings and specifications

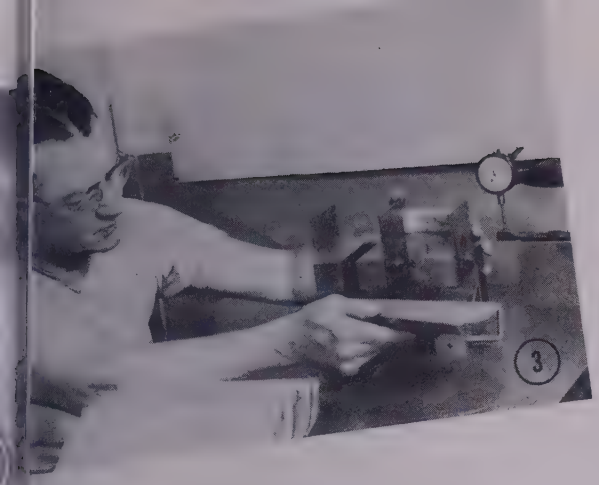
Fig. 3—Knives of the guillotine gages drop on critical sections of the turbine blade and indicate correctness of contour

BECAUSE of the close tolerances required and th commercial use of the forged part, inspection of pre cision forged turbine blades and buckets cannot b stressed too highly. Standard tolerance adopted b the Drop Forging Association for impression di forgings of comparable weight (4/10-pound) is plu 0.027-inch, minus 0.009-inch thick, and a shrinkag and die wear tolerance of plus or minus 0.015-inch It has only been in recent years that the forging in dustry has even attempted to forge to the plus o minus 0.005-inch thickness tolerance that must b held in precision blade work.

Add to this a warp angle tolerance of plus o minus 30 minutes; a contour tolerance of plus o minus 0.0025-inch per blade surface; a bow or de flection tolerance of plus or minus 0.010-inch, an one has not only a forging problem that require highly specialized techniques, but an inspection prob lem as well.

To insure quality control five major steps are use in the inspection procedure at Steel Improvemen & Forge Co.: Preparatory layout and engineering, di inspection, forge inspection, hardness inspection an final inspection.

Preparatory Layout and Inspection—When eac new order is received, it involves considerable wor on the part of the inspection department to "get th ball rolling". First, ten times size (10X) maste plates are made either on vinylite or glass plates fc every blade section on the customer's blueprint. O some compressor blades currently used in Air Forc fighters, this involves as many as 11 different sectio al layouts. These sections are usually at regular i tervals relative to the head, also referred to as th dovetail, root, anchor or butt. The plates requi layout work of extreme accuracy as they are th master for all subsequent inspection. Second, stan ard master plates are also made at this time for us



By R. F. WAGNER
Chief Inspector
Steel Improvement & Forge Co.
Cleveland

n the Pant-O-Scriber. Guillotine gages, inspection emplates and special blade holding fixtures are designed to facilitate rapid and accurate inspection.

Die Inspection—Before a die sinker may proceed with the sinking of an impression, all working templates must be passed by inspection. The templates re checked for squareness; for accuracy of contour gainst the master plate on the comparator; for a onstant center-line distance to the "matched edge," r left side of the template; and for the relation of epth of contour to the working faces of the die sually referred to as the "locks." These templates re held to 0.0005-inch accuracy, or they are subject o rejection. If satisfactory, they are stamped by the nspection department's seal of approval. The exaustive checking of templates is necessary to eliminate costly errors and unnecessary delay in the fulillment of the delivery promise.

When the dies are completed, not only is the finish mpression checked to see that it conforms to the customer's requirements, but the preliminary impressions re also checked to see that they conform to the orging and engineering development drawings. The ies, usually small inserts, are brought to the inspection department and given a surface plate layout. Here all necessary equipment such as height gages, age blocks, vernier protractors, sine-bars, etc., are vailable. The inspection department assumes all esponsibility in assuring the forge shop that the ies furnished them are of such accuracy as to make t possible for them to meet customer specifications.

Forge Inspection—The initial inspection of a forged lade is made directly at the hammers. Here such roblems as line-up, surface conditions and visible laws are controlled. If the forging indicates that he two halves of the die are not in their proper reation, instruction is given to the hammerman by the ot inspector as to the amount and direction necesary to move his dies to correct this condition. If he surface condition is poor, the inspector calls for a echeck of the furnace temperature and atmosphere ontrols.

The first forging to pass the hot inspector is submitted to the inspection department for complete imensional analysis. This includes a check of the airfoil sections and their relation to each other on the Pant-O-Scriber. The Pant-O-Scriber is specially designed for checking the airfoil section of a blade or bucket in a nondestructive manner. It consists of two tracing arms with ½-inch Carboloy tracing rollers that follow the contours of a given section of a blade held upright in a specially-designed holding fixture. At the other end of the arms are two individually driven-scribing heads that scribe ½-inch spiral circles on coated glass. One arm is for the concave side of the blade section and the other is for convex side. This produces an image on the glass which is an exact duplicate of the section traced.

The glass plate is then superimposed over a master reticle of the desired contour and the two are placed in delineascope. The operator views the enlargement projected against a screen and determines the acceptibility of the blade. Where a discrepancy exists between the two contours, built-in micrometers are used to move the master reticle in line with the scribed profile so the amount of error can be noted. The delineascope is provided with an accurate angular vernier which also enables the operator to measure any twist or warp angle discrepancy.

After a thickness check, the sample is subjected to Magnaflux inspection, a nondestructive method of detecting concealed flaws which may have been overlooked by the forge inspector. Other blades are checked periodically during the forging run.

Hardness Inspection—The varied shapes of thin, small areas of turbine blades present difficulties in obtaining smoothly ground parallel surfaces for Rockwell testing. Special techniques of grinding were developed to overcome these problems. Acceptable hardness ranges, approaching the limits of machinability, are narrow, the heat treating must be carefully controlled to avoid rejections. All turbine blades are given a 100 per cent Rockwell check to insure forgings to the customer's hardness specifications.

Final Inspection—All forgings go through final inspection where they are stamped to indicate the mill heat number, customer's part number, and the date before being released to the shipping department. This inspection consists of an exacting visual inspection for pits, unfilled areas or other flaws. Visual inspection is followed by Magnaflux or zyglo inspection to insure quality and soundness.

Dimensional, straightness, contour and warp angle checks follow in order. These are made by the use of guillotine gages and quick-reading dial indicators. A guillotine gage is a box type fixture that holds a blade so that the center of gravity is true relative to the sides or ends of the fixture. A series of section templates or knife blades (hence the term guillotine) are brought against the contours of the blade at the designated sections, both front and back. The edges of the knives that come in contact with the blade are a reproduction of the contours for that section taken from the master plates.

In checking the blade for accuracy, any error between blade and template is checked by the use of round feeler gages. The position of the templates, relative to the fixture, indicates any discrepancy in warp angle and bow. Whenever a blade or bucket does not come up to the particular standard set for it, or is out of tolerance it is rejected.

FUNDAMENTALS of STEELMAKING

NUMBER 14 OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

Production of

Seamless Steel Pipe and Tubes

In this second part, the author continues his discussion of the seamless tube rolling process as used today. The new continuous tube rolling mill now being installed by National Tube Co. is described in detail

By BRYANT BANNISTER
Consulting Engineer
National Tube Co.
Pittsburgh

PART II

REFERRING to Fig. 9, it will be noted that the three principal elements of the expanding mill are, as in the piercers, the rolls, plug and guide shoes. Rolls are of the disk type mounted on driven spindles at a wide angle to the mill axis or pass line. The axes of these spindles lie in planes parallel to each other and to a horizontal plane through the mill axis, one axis lying above and one below the mill axis. While not apparent in the figure, this arrangement provides a feeding effect to the shell being expanded and is equivalent to the skewed axis arrangement employed in piercing mills. Working faces of the disks are at such an angle to the plug profile that the shell in traversing the pass has its wall thickness reduced. In theory, the wall is reduced at a rate sufficient to provide for the expansion of the shell on the basis of no shell elongation. However, to compensate for variation in wall thickness of the entering shell, profiles are such that over-expansion would result if not limited by the guide shoes which force excess circumferential growth into length.

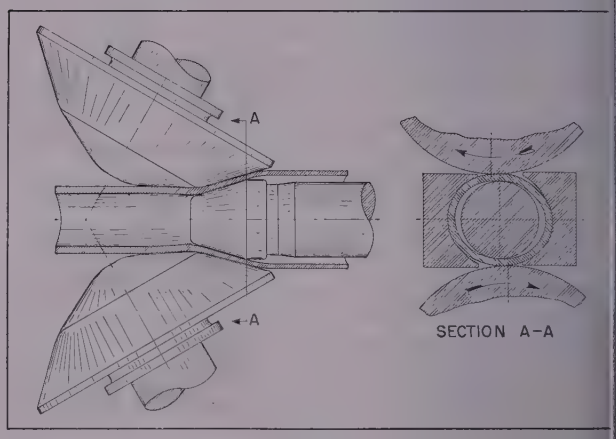


Fig. 9—Description of rotary rolling operation

In expanding, it is desirable to avoid twisting of the shell. This is accomplished by giving the disks substantially the same rate of expansion as the shell. This proportioning tends to cause each revolution of the disks to produce the same number of revolutions of the shell at any section of the expanding cone. The action is similar to that between the two elements of a bevel gear and pinion combination. Fig. 10 shows a pipe emerging from a rotary rolling mill.

From the expanding mill, pipe is conveyed to and through the reelers as previously described.

After reeling, all pipe produced by the process herein described is passed through a tunnel-type furnace (see Fig. 11 which shows a pipe about to enter such

Fig. 10—View of 26-inch OD pipe emerging from the rotary rolling mill

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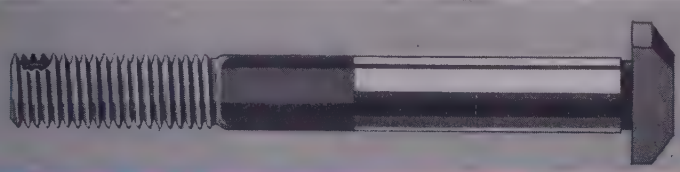

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Fig. 11—Pipe after reeling is seen about to enter a tunnel-type furnace prior to delivery to a sizing mill

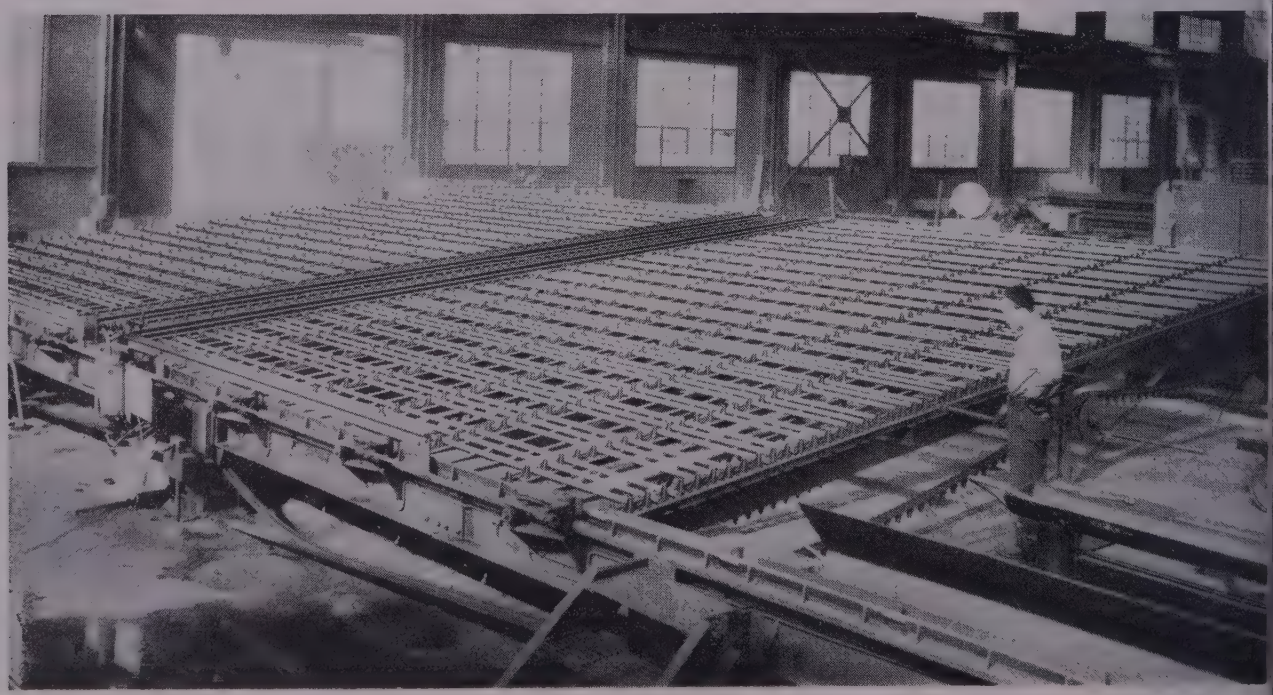
a furnace) to a sizing mill. In the case of larger pipe, such a mill generally consists of three or more stands of driven rolls, two rolls to a stand and each provided with a semicircular groove, the two forming a circular opening through which the pipe must pass. The first groove is slightly (approximately 3 per cent of pipe diameter) smaller than the reeled pipe. The following stands are correspondingly grooved, with the last two being the same diameter to assure roundness and proper size. Alternate stands are mounted with the roll axes at 90 degrees to each other. Since pipe is at an elevated temperature during sizing (approximately 1850 to 1900° F), allowance is made f shrinkage in cooling. From the sizing mill, pipe rotated slowly over a cooling table until it reach approximate room temperature.

For smaller pipe, and especially sizes under 8 inches in diameter, the number of stands may ran from 5 to 16. There is no physical reason why mo stands cannot be employed if greater diameter redu tions are desired. When the number exceeds 7, it good practice to drive each stand with an individu adjustable-speed motor, whereas in larger mills fewer stands, where the operation is merely one sizing, all stands may be group-driven by a sing constant speed motor.

In discussion of the various phases of seamle tube manufacture, the role of each unit has been d scribed. It was also previously indicated that t number of operations is dependent on size of tu being produced. To further clarify these discussion the following examples, which typify the variatio employed in the manufacture of seamless tubes a given to develop operations step by step.

In producing a 2⅜-inch OD by 0.154-inch sing length hot-rolled tube, a solid billet 3¼ inches in dia eter and weighing approximately 82 pounds is pierc to a shell 3-7/16 inches with a 0.215-inch wall, abo 11 feet long. This pierced shell is passed, without r heating, to a plug rolling mill where it is plug roll in a 3¼-inch groove to produce a 3¼-inch OD tu with a 0.140-inch wall and 17 feet 6 inches long. T plug-rolled shell is then reeled to approximate 3-7/16 inches OD, 0.140-inch wall, and about 16 fe 6 inches in length. After reeling, the tube is pass through a reheating furnace and into a reducing si ing mill from which it emerges 2⅜ inches OD with 0.154-inch wall and about 22 feet 3 inches long.

Fig. 12—Conventional-type pipe cooling table which receives pipe after sizing



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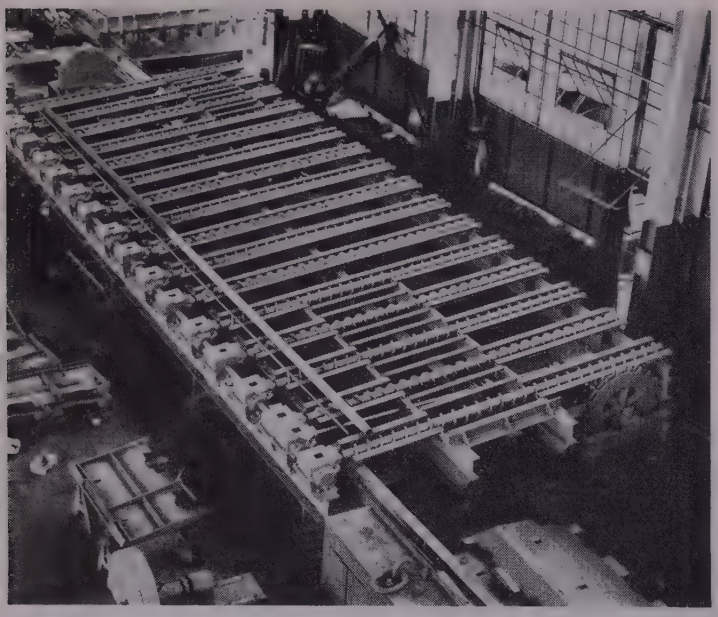


Fig. 13—Screw-type pipe cooling table which was recently developed is particularly applicable to the handling of small diameter pipe

In producing a double length hot-rolled tube 8⅝ inches OD with a 0.277-inch wall, a solid billet 8¼ inches in diameter, 6 feet 4 inches long, weighing 1166 pounds is pierced in the first piercer to a shell 8 inches OD, wall thickness of 1¼ inches and 12 feet 10 inches long. Without reheating, this shell is further processed in the second piercer to a shell 8⅝ inches OD with a 0.470-inch wall, and approximately 28 feet long. The shell from the second piercer, after reheating, is plug rolled in an 8-7/16-inch groove to 8-7/16 inches OD, 0.277-inch wall and 46 feet 9 inches long. The plug rolled tube is transferred directly to the reeling machine which produces a tube of 8¾ inches OD, 0.277-inch wall, and 45 feet 5 inches long. The tube then receives two or more passes in a two-high sizing mill from which it emerges 8⅝ inches OD with a 0.277-inch wall and approximately 46 feet long.

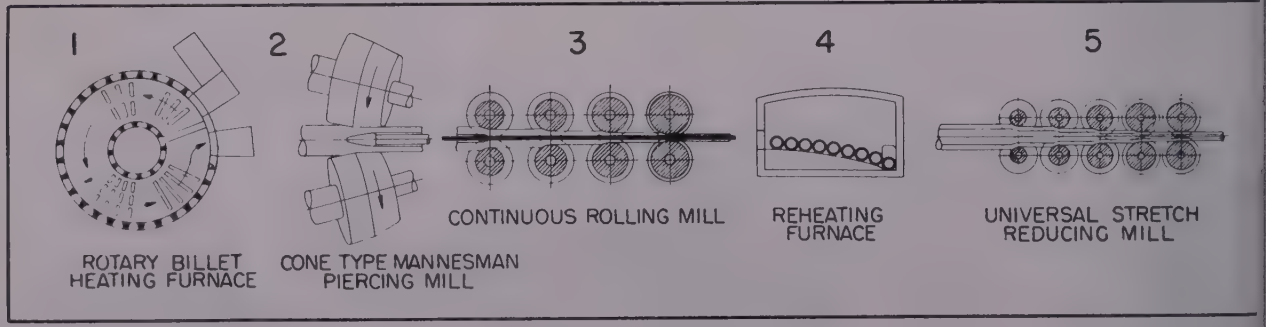
To produce a 26-inch OD, 0.303-inch wall double length hot-rolled tube, a solid billet 12¼ inches in diameter, 10 feet long and weighing 4007 pounds is pierced to a shell of 14 inches OD, 1.640-inch wall, and 18 feet 3 inches long in the first piercer. This shell, in the same heat, is entered in the second piercer where it is rolled to 17 inches OD, 0.750-inch wa and 30 feet 2 inches long. After reheating, the sh is plug rolled to form a tube of 16¾ inches OD, 0.50 inch wall, and 44 feet 9 inches long. The plug-roll shell is reheated a second time, after which it rotary rolled to 26¼ inches OD, 0.303-inch wall, a 45 feet 8 inches long. Without reheating, it is th reeled to 26½ inches OD, 0.303-inch wall, 45 feet inches long. The tube after reeling, is again reheat in the tunnel-type reheating furnace, after which passes through two stands of two-high sizing m rolls, forming a hot-rolled tube 26 inches OD, 0.30 inch wall, and 46 feet long.

In the case of small pipe and tubing, up to a proximately 4½ inches OD, the possibilities present by the proper application of the stretch reducing m are very substantial indeed. In any seamless oper tion employing cross rolling, as in the piercing mi rate of linear production is quite limited. This true regardless of product size. Consequently, t rate of production measured by weight increases wi the product diameter and wall thickness. It follo logically, therefore, that any step in the proce which, for a given product, increases size of t pierced and rolled shell will increase output of t mill provided suitable means are used to reduce t oversize shell to the desired pipe size. The mul stand adjustable speed stretch mill is a very efficie unit to perform this latter operation.

A stretch reducing mill consists of a series of pa of rolls, mounted in housings and spaced as close one another as design considerations will permit. Ea consecutive pair of rolls is driven at a speed in cess of that required to deliver an equal volume metal per unit of time from each roll stand. Te sion is thereby developed in the tube between stan Much greater diameter reductions can be attain with tension than can be obtained in conventio rolling. Without tension, reductions in diameter about 3 per cent are common, while with tensi these diameter reductions can be as high as 10 p cent. Rolling in tension also permits tube wall duction simultaneous with reduction in diameter. T is impossible with conventional sizing in which dia eter reductions result in an increase of the wall thi ness.

A conventional cooling table that receives pi after sizing consists of rails laid parallel to ea other and on which the pipe is caused to roll in t direction the rails are laid. Motivating force is su plied by driven endless-chains supported parallel

Fig. 14—Modern continuous seamless pipe and tube mill capable of rolling ½ to 6-inch OD pipe



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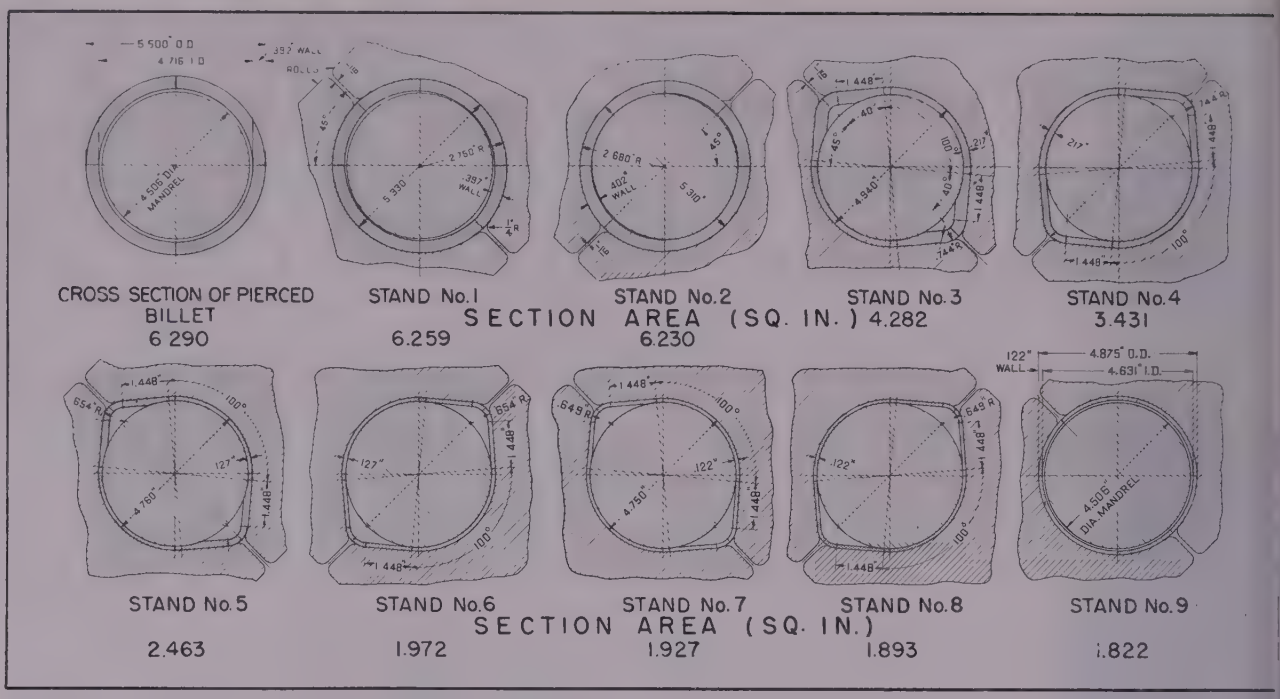

Fig. 15—Pass design for a nine-stand continuous tube mill when rolling 4.875-inch OD by 0.122-inch wall pipe

and just below the upper surface of the rails. The chains at the top and bottom of the table reverse direction on sprockets. Paddle-like fingers carried by the chains project above the rail surfaces and push the pipe forward causing it to roll. The paddles are in alignment across the table, thus keeping the pipe in a straight line. Fig. 12 illustrates such a cooling table.

Recently, a cooling table of quite different construction has been developed. This table, which may well be classed as the "screw" type, is particularly applicable to the handling of small diameter pipe. Rails are present as in the conventional type table but in place of chains the actuating mechanism consists of pipe around which are wound rectangular steel bars in a helical direction, forming a huge auger-like screw. These screws are disposed parallel to and between the rails and power rotated, causing the pipe which rests against the helical members to rotate and advance across the table. One-half of the screws are left handed and one-half right handed and are rotated in opposite directions. This construction tends to prevent pipe from moving either to the right or left as it progresses across the table. With this type cooling table, it is a simple matter to speed up either side of the table by slightly enlarging the pipe core of the screw. The pipe will then travel endwise in the direction of rotation of the enlarged section. This construction can be utilized to move the pipe first to one side against a stop where a crop can be cut by a saw and then a little farther along the table in the opposite direction for cropping the other end. Fig. 13 is a good example of a screw-type table.

After cooling, seamless pipe, whether large or small, is ready for various finishing operations which include straightening, if necessary, inspection, cutting-off, testing, threading, marking, coating, etc.

It is not the purpose of this discussion to deal with the many finishing operations to which pipe may be subjected. An effort has been made to outline principal operations employed today in this country in the manufacture of practically all seamless pipe. Certain modifications of standard practice in pipe manufacture, however, have reached the construction stage, while others have only been explored on paper with some experimental background.

One of the most interesting and potentially valuable contributions to the art of making seamless pipe is the so-called "continuous-tube rolling mill". Essentially, the tube rolling mill is similar to a modern strip mill in that the tube passes progressively from stand to stand, each stand effecting a reduction in wall thickness. This mill has had a considerable background of experience in Europe and to some extent in this country, but nowhere on as substantial a scale as one now being constructed by National Tube Co. This mill is designed to deliver pipe 65 feet long in sizes from 2 to 4½ inches OD at rates up to 900 feet per minute out of the last stand of roll. After further processing in a stretch reducing mill lengths up to 400 feet and delivery rates as high as 2200 feet per minute will be attained.

The above mill consists of nine individually powered stands in tandem of two-high grooved rolls. Rolls in consecutive stands have their axes at 90 degrees with each other, each stand being set 45 degrees to the horizontal. Motors driving these roll stands aggregate 8500 horsepower, and all are of the adjustable-speed type. An internal cylindrical bar or mandrel against which the pierced billet or workpiece is rolled is required. This mandrel, which is considerably longer than the workpiece, is telescoped

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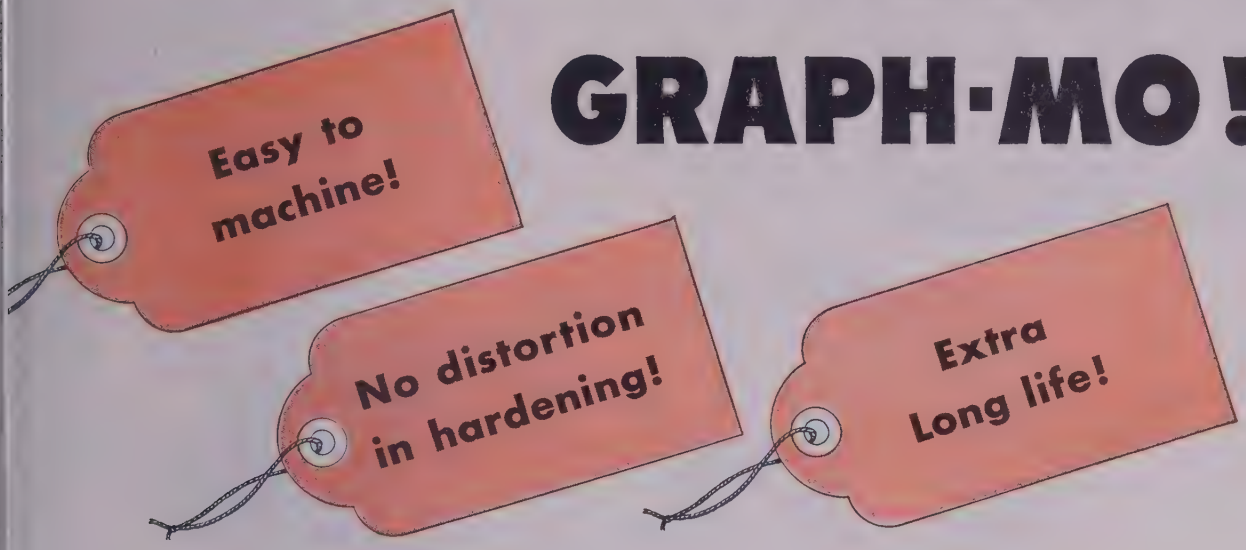

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through the workpiece immediately before it enters the mill and passes with the workpiece through the mill during rolling.

Fig. 14 illustrates the operational sequence where a rotating-hearth billet heating furnace and reducing-type piercing mill are employed ahead of the continuous mill with a stretch reducing mill following it. In this diagram, rolls in both the continuous and reducing mills are shown in a common plane for ease of illustration; actually alternate rolls are in planes 90 degrees apart as stated earlier.

Fig. 15 is presented to illustrate a typical continuous mill pass setup wherein a pierced billet of 5½-inch OD by 0.392-inch wall is reduced in nine stands to a tube of 4⅞-inch OD by 0.122-inch wall. If the tube leaving the continuous mill is 65 feet long, the entering billet would have a length of about 19 feet which could be produced in a piercer of the type shown in Fig. 14 from a solid round billet 5¾ inches in diameter by 4 feet, 7 inches long. Rate of production for a mill of the described type is generally limited to the rate at which billets can be pierced. With a high speed piercer, the above product could be processed at the rate of four tubes per minute. This represents an output of 48 tons per hour. To illustrate the tremendous production possibilities of a well balanced mill, including the stretch-reducing unit receiving the above tube and converting it into ½-inch standard pipe, the above production rate is equivalent to about 21 miles of pipe per hour. Of course, actual production would fall below this rate due to mill delays, etc.

The first two stands of the continuous tube mill reduce diameter of the workpiece until its inner surface is in substantial contact with the mandrel. In future mills, it is quite possible that these two stands can be eliminated by precise control of the inside diameter of the pierced billet. Each of the next two stands make a reduction in wall over a portion of th circumference, the two jointly completing the fir increment of reduction. The next two stands, th fifth and sixth in this layout, make a similar con plete but smaller wall reduction. The seventh ar eighth stands might be termed planishing stands they make a very light reduction and iron out ar residual ribs which may carry through from previo stands. It will be observed that each of the r grooves is concentric with the mandrel over only 1 degrees of arc, the remainder of the groove bei flared away from the mandrel. This contouring a lows the workpiece to assume an oval shape wi substantial clearance from the mandrel at diametrica ly opposite areas. The ninth stand is provided wi a circular groove to round up the tube, freeing it fro contact with the mandrel. The tube and mandr are then kicked out of the pass line and the mandr is withdrawn by a stripper mechanism. The mandr of which there are several in the circuit, is th cooled, oiled, and returned to the entry side of t mill. The tube, after reheating, proceeds to t stretch reducing mill for further processing.

REPRINTS AVAILABLE

REPRINTS of this article in the series "Fundamentals of Steelmaking" and others published over the past few months may be obtained at nominal cost by addressing Readers' Service Department, STEEL, 1213 W. Third St., Cleveland 13, O. Other subjects covered include blast furnace, open hearth and electric furnace practice, tool steels, roll design, coke production, plates, sheets and strip, tin plate, structurals and rails, scrap, bessemer steel, butt and lap weld pipe and seamless tubing.

Filter Improves Cleanliness

GREATER efficiency and cleanliness are assured in the Cleveland plant of Taylor-Boggis Foundry Co. with a recently installed dust filter unit. In a new building for the machining of ferrous castings, one of the production lines is arranged for the dustless grinding and buffing of small cast iron castings. The two double wheel grinders and one double spindle buffer are hooded and ventilated to a dust filter mounted outside the building, this unit produced by W. W. Sly Mfg. Co., of Cleveland.

An exhaust fan and drive mounted on top of the dust filter casing creates suction at the machine hoods which draws the dust and metal particles through the piping and into the filter. The air borne material is retained on the cloth filter bags, allowing only clean air to pass through to the atmosphere, the company states.

Filter casing is fitted at the bottom with a hopper into which the dust falls when the filter bags are agitated by a shaking device, automatically operated when the exhaust fan is stopped. Another production line of two automatic screw machines, a double spindle drilling machine and a hand milling machine are ventilated and kept dust-free by a dust filter installed inside the building.

Test Demonstrations at Expo

TWIST, heat and quench tests to demonstrate bond permanence and tests to show uniformity of cladding thickness will be performed on clad steels made by Lukens Steel Co., Coatesville, Pa., at the 22nd Exposition of Chemical Industries, New York, November 28 to December 3. Simplicity of clad steel plate polishing will be demonstrated and a display panel will depict the welding sequence for such steels.

Displays will include examples of flame-cut, sheared, bent, pressed a blanked parts produced by By-Pro ucts Steel Co. division of Lukens a also a jacketed steel drier roll a labyrinth steam platen, the latt developed by Lukenweld Division.

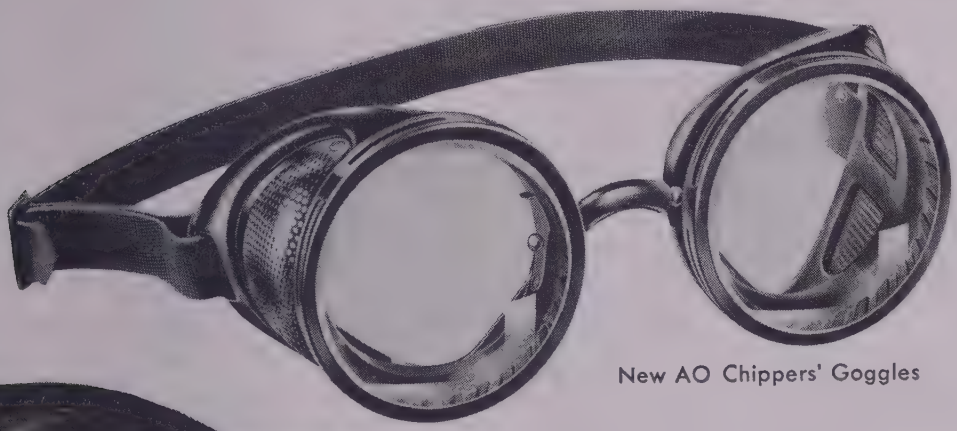
Nickel Alloy Resists Corrosion

GOOD machinability, higher resis ance to corrosion and freedom fr any tendency to seize or gall wh used in moving contact with its or other metals, including the stai less steels, are properties of a n nickel alloy announced by Waukes Foundry Co., Waukesha, Wis. S to contain no copper and to be f of iron, the metal is available in c form only and is designated as W kesha Metal alloy No. 23.

Alloy does not require heat tre ment and in the as-cast conditi has a tensile strength of 50,000 60,000 psi, and an elongation of to 10 per cent and a brinell ha ness of 145-165 at 3000 kg load.

Eye Safety First and Last

NEW AO CHIPPERS' GOGGLES



New AO Chippers' Goggles

for Metal Workers!

The new AO 319 cup goggle is compression molded from a strong, NON-FLAMMABLE, non-swelling PHENOLIC compound for the maximum efficiency in fit, comfort and protection. It is ideal for chipping, grinding, babbiting, riveting, hand tool operations, rail cutting, spike driving and cutting rivets.

Workers like the DOME METAL SIDE SCREENS that both protect and provide cooler ventilation . . . the individually molded, non-reflecting eyecups . . . the wide view of the work. Formfit chain bridge, large lens ring, one-piece rubber headband. 50 mm 6 Curve Super Armorplate lenses, clear or Calobar in medium, dark or extra dark shades. Your nearest AO Branch can supply you.

Your AO Safety Products Representative can supply you

American Optical COMPANY
SAFETY PRODUCTS DIVISION

Southbridge, Massachusetts • Branches in Principal Cities

Intensified STEEL INDUSTRY RESEARCH To Pay Off

Expanded technological activities in various phases of operations, revealed at first of AISI regional meetings, to be reflected in improved products

STEEL industry is engaged in more study and research work than ever before and many of the projects will lead to new and improved products. This fact was emphasized in Chicago, when the American Iron and Steel Institute conducted the first of a series of five regional technical meetings.

A similar meeting was held in Youngstown, O., Oct. 13, and other similar meetings of the institute are scheduled for Birmingham, Ala., Oct. 26; New York, Nov. 2; and San Francisco, Nov. 10. The series was originally planned to embrace six meetings with the initial one in Buffalo, Sept. 29, however, it was necessary to cancel this gathering because of the then impending steel strike.

Purpose of the meetings is to report to steel industry executives and technologists on progress being made in 40 technical and scientific projects which will help accelerate advancement of steel and benefit American industrial economy. The 300 who attended the Chicago meeting heard speakers tell how metallurgy is probing new fields, how efficiency of plants, processes and equipment is being improved and how new opportunities for use of steel are being developed.

Four Standard Addresses—Morning sessions for all five meetings embrace three addresses: "Comments About the Steel Industry," by Walter S. Tower, institute president; "How To Use Institute Facilities," by George S. Rose, institute secretary; and "Institute Research Projects," by C. M. Parker, institute metallurgical engineer. One of four afternoon technical papers, "Observations on Corrosion of Ferrous Metals," by G. D. Lain, research engineer of the institute, is also common to all regional meetings. Three additional papers vary city by city.

H. W. Johnson, vice president in charge of steel manufacturing, Inland Steel Co., Chicago, presided at the Chicago morning session, and J. Hart Reece, chief metallurgist, Colorado Fuel & Iron Corp., Pueblo, Colo., at the afternoon session.

Mr. Tower focused his remarks on the growth of the steel industry in the past decade and the growing importance of the Chicago area. Mr. Rose outlined activities of the institute, mentioning specifically that about a dozen divisions are engaged in a wide variety of activities, and their studies, reports and statistics are available to members of the institute and the public.

Many Research Projects—From tin can materials to railroad equipment, there is much of significance in research projects being conducted by the steel industry, said Mr. Parker. The future will see better protective coatings for steel, improved pipe, new structural uses for light-gage steel, use of substitutes for imported palm oil in making tin plate, better wheels and axles for railroad cars, and scores of other contributions to the general advancement of American life, the speaker predicted.

At the same time, he continued, steel is confronted with problems created by the gradual deterioration of the quality of some of its raw materials. Much research is aimed at overcoming these problems, which pertain to coal and coke, iron ore and other materials.

Mr. Parker summarized a long list of research projects which are being sponsored entirely or in part by the institute. These projects are far more numerous now than a few years ago, with more than 30 universities and research institutions participating in the program. They constitute a new high level of co-operative research in steel.

"It should be recognized that the complexities of American industr have arrived at a point where muc research may be too big for eve the largest company in an industr to handle alone," he said. "Problem of this sort, of course, are commo throughout the industry, such as thos having to do with raw materials, c fundamental manufacturing processe used by all companies. It is in prob lems of that sort that the institut has its major interest. It is obviou that when a large number of com panies within an industry co-operat to solve problems of that natur the small company is on exactly th same basis as the large compan in reaping benefits of the result obtained."

The famous iron pillar of Dell has been preserved for centuries, bu it would not withstand the corrosiv atmosphere of a modern industria community with occasional wettin by rain and dew, Mr. Lain said. Th environment of iron and steel play a large part in their ability to with stand rust.

Corrosion Classified — Work ha been carried on to classify differen types of corrosion according to en vironment of metal, he said. Corro sion can be classified into seve classifications, depending upon th nature of surrounding media, thes classifications being atmospheri bacterial, chemical, high-temperatu oxidation, soil, stray current ele trolysis and underwater.

Natural waters vary according t mineral composition and dissolve gas content. Their effect on met depends on these factors, the ten peratures at which they are use rate of flow, pressure in the syste and formation of protective film The nature of films deposited b the water on metal is also importa in resistance to corrosion.

At Case Institute of Technolog Cleveland, investigations are und way on factors affecting corrosio of galvanized steel pipe by domest waters, said Mr. Lain. Purpose this work is to determine the caus of exceptions to the usual long li of galvanized steel pipe in corrosi natural waters and to develop mea of overcoming those causes.

Twenty Years To Prepare — T iron and steel industry has rough 20 years in which to prepare for e haustion of high-grade iron ores, b a vast quantity of low-grade o exists, according to Francis X. Ta taron, manager of ore research, Jon & Laughlin Steel Corp., Pittsburg who presented a paper on "Benefi ation of Northern Iron Ores." (the eastern end of the Mesabi ran a portion of this ore is of such natu that it may be treated economica

COLORADO FUEL AND IRON CORP. CHOSE

Eichleay

The new five-million dollar Rod Mill of the Colorado Fuel and Iron Corp. at Pueblo, Col. marks the highest and most important achievement in the progress of steel wire making.

Eichleay was chosen to install the new-type Morgan Rod Mill which is the main feature of the plant, also the heavy cranes and all mechanical equipment, and to erect the structural steel which houses the mill.

Eichleay appreciates the honor of having been called upon for this service and of having been permitted to participate in the Pageant of Progress commemorating this important advancement in steel wire making.

Eichleay stands ready to furnish all industries the following services—

Plant Erection—Installation of Machinery—Relocation of Industrial Units—Construction of Foundations for Buildings and Equipment—Moving of Structures—Shoring—Rigging—Underpinning

Write for your copy of the new illustrated booklet showing all types of erection, installations, etc.

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for use in the blast furnaces today. Hence, the transition from high to low-grade iron ore is already taking place, he said.

In discussing the nature and quantity of low-grade ores, Mr. Tartaron divided them into two classes—taconite and intermediate type ores. The former exists in very large quantities and is the basis for reserves in the future, but require expensive methods for treatment. The latter can be treated for blast furnace use economically, but the available quantity is relatively low.

No clear cut production can be made at present on the final exhaustion of the high-grade ores and the ironmaking techniques of the future, Mr. Tartaron stated. These things depend on the success of current experiments in making available the enormous quantities of low-grade ores at reasonable cost.

No other metal can compete with tin for corrosion resistance in food packing, according to John N. Crombie, assistant metallurgical engineer, Carnegie-Illinois Steel Corp., Pittsburgh, speaking on "Tin Plate." Wartime experiments with other metals for food packs conclusively proved the pre-eminence of tin plate for the purpose, he pointed out. Tin cans are practically all steel, with a thin coating of tin.

Canning Technology Changes — New developments taking place in the technology of canning soon should enable canned food to better its position as compared with frozen or fresh food, he continued. These newer packing procedures, which allow shorter cooking time and greater retention of flavor, are now in limited use.

Significant progress has been made in the manufacture of better tin plate for canning, Mr. Crombie asserted. For example, between 1931 and 1944, life expectancy of cans for many fruits and vegetables has more than doubled, in some cases exceeding 96 months, he said. Adoption of cold-reduced steel rather than hot rolled was almost entirely responsible for these improvements in performance of tin plate for canning.

Shortly before World War II, the successful application of the electrolytic process of tin plating made possible the conservation of scarce tin. The process puts a thinner layer of tin on the steel, while affording satisfactory corrosion resistance for many products to be canned.

"During the past 15 years, the tin plate industry has been very progressive, and the present products are the result of much research largely unknown and unappreciated by the public," said Mr. Crombie.

Heat Determines Quality — Steelmakers must carefully control the temperature of molten steel while it is being made because that is one of the most important factors determining its subsequent quality as a sheet, a beam or whatever form it is made into, said J. G. Mravec, melt shop metallurgist, Steel & Tube Division, Timken Roller Bearing Co., Canton, O. His paper was entitled "Bath Temperature Measurements."

The difficulty in control of temperature, however, is to get an accurate indication, Mr. Mravec explained. The desire to attain accuracy has been the driving force back of the development of two new devices that can be dipped into the molten metal without being destroyed—immersion bath pyrometers they are called. By means of photronic cells, thermocouples and other devices, accurate measurements now can be obtained. Their use in the steel industry has expanded rapidly since 1946.

ACCURACY PLUS: Steps seen on the face of this 13-foot diameter forging measure only 0.017-inch deep. This is one of a pair of pole caps installed in a 400 million volt cyclotron to be operated near Pittsburgh by Carnegie Institute of Technology. Forging was machined to an accuracy of 0.0015-inch on major dimensions and to a parallel tolerance of 0.0025-inch in shops of Continental Foundry & Machine Co., Wheeling, W. Va. Accurate dimensions and contour are necessary to control shape of magnetic field in the cyclotron and to properly direct the paths of atomic projectiles used in atom smashing

New Rod Mill

(*Continued from Page* 60)

stands of continuous mills.

Leaving the last continuous intermediate stand, the rod is repeated through a single stand, then reversed repeated into a second single stand and thence either delivered to two pouring reels or reverse repeated a third time to enter a 7-stand high speed continuous finishing end train.

Rod Mill Proper—The stands in the rod mill proper, numbered in the Morgan conventional method, begin with No. 0; No. 0 to 8, therefore comprise the roughing end; No. 9 to 13, the intermediate mill; and No. 14 and 15 being individual repeating stands; and No. 16 to 22, inclusive the high-speed finishing end.

The 6600 v, 3 phase, 60-cycle power for the new rod mill is controlled by twelve sections of General Electric metal-clad switchgear with type AM -15-500 power circuit breakers of 1200 amp capacity and 500,000 kva interrupting rating.

A 6300 hp, 6600 v, synchronous motor drives three 1500 kw, 600 v generators to supply power through adjustable speed control equipment to ten shunt wound, separately excited adjustable speed, direct current mill drive motors, which with their control were furnished by General Electric.

Operation of all mill motors is controlled by the main mill pulpit operator. A control desk is provided in the mill pulpit which incorporates, in the generator section, controls for coarse and vernier adjustment of generator voltages with voltmeters to indicate the voltage output of the

enerators; and in the motor sec-ons, controls to separately adjust ne speed of each motor by field ontrol and meters to indicate load nd speed.

Operation of a master motor-oper-ted potentiometer rheostat changes ne voltage of the entire mill from to 600 v. Voltages of the individual us sections may be varied indepen-ently of each other by operation of neir voltage potentiometer rheostats. his permits starting all mill motors y generator field control and also ermits simultaneous group speed ad-ustments. Mill motor control pro-ides for emergency reversal; dy-amic braking; overload, undervolt-ge and over-voltage protection; full ield relays; and field accelerating elays.

Cleveland Crane and Engineering o. provided the mill crane which as a 15-ton main hoist, 5-ton auxil-ry and a 96-foot span and the billet ard crane which is a 15-ton single oist with a 96-foot span. Shaw-Box ranes are used in the motor room nd roll shop and are of 25-ton, 36½-oot span and 5-ton floor operated 37-oot, 4-inch span respectively.

Roll Shop Equipment — The roll shop building is 40 feet wide and ap-proximately 112 feet long and ad-joins the north end of the rod mill building. Roll turning and grinding equipment includes two 18-inch United roll lathes, one 32 x 108-inch Monarch-Keller form turning lathe, and one 20 x 96-inch Landis roll neck grinder.

Various tool grinders for high-speed and carbide tools complete the equip-ment. Roll storage racks for finished rolls are also located in this building.

Billets for the rod mill are heated in a two-zone heating furnace with a capacity of approximately 60 tons of steel hourly. This furnace was de-signed and erected by the Rust Fur-nace Co.

General construction of the furnace is as follows: The hearth is level and is 69 feet, 8½ inches long and 26 feet wide. The walls are encased in steel binding and have vertical expansion joints to allow the brickwork to ex-pand freely without rupturing the steel binding when the furnace is brought up to operating temperature. The roof is completely suspended from the steel framework and re-fractory hanger tiles are used to hold the roof brick in place. There are two chokes in the furnace. A choke is the decreasing of the space be-tween the roof and the hearth in order to bring the heating gases down to the steel for more efficient heating. One choke is between the soaking zone and the heating zone; the other

BRIDGE OF FUTURE: Although not intended to fly, the welded bridge will have a bomber's gracefulness, strength, rigidity and light weight, asserted the James F. Lincoln Arc Welding Foundation, Cleveland, in making the awards in the 1949 welded bridges of the future program. Artist's conception of the design that won the first prize is shown here. Recipient is Thomas C. Kavanagh, professor, civil engineering, Pennsylvania State College, State College, Pa.

choke is between the heating zone and the preheating zone.

The billets enter the preheating zone from the side of the furnace at the back, and are pushed forward by a pusher machine at the back of the furnace. The first 40 feet, 2 inches of hearth is first quality fire brick with cast steel dry skids. The next 11 feet, 6½ inches of the skids to the soaking zone are Carbofrax skids and first quality fire brick, and the last 15 feet, 8 inches of the hearth in the soaking zone is plastic chrome ore rammed into place and fired to 2600° F. The function of the heating zone is to heat the steel billets to approximately rolling temperature. The billets then enter the soaking zone where the heat is allowed to soak into the interior of the billet, thus assuring uniform heat distribution throughout the cross section of the billet. The billets are then side discharged into the break-down rolls of the mill.

Modern Controls Utilized—The following controls are in use: The coke gas pressure is reduced from a pressure of 3 to 5 pounds to 0.75 pounds by a Fisher regulator. The coke gas temperature is controlled by means of a steam heater built by the operators. The gas passes through tubes and the steam passes around the tubes. The temperature is controlled by Masoneilan equipment. The purpose of heating the coke gas is to prevent the deposit of vapor phase gums which exist in coke oven gas. Unless heated these gums deposit in the lines and on controlling butterfly valves, orifices and burner ports. The flow of gas is recorded by a Bailey meter. The remaining controls are best described in the order of the action which normally takes place. When the furnace temperature varies from the desired and set control temperature, the action is as follows: A Leeds and Northrup controlling pyrometer causes a change in the gas flow by positioning a motor-driven gas butterfly valve. Orifice plates are installed in the gas and combustion air lines. The orifices are designed so that a given differential from the gas orifice should be balanced with a comparable differential pressure from the air line orifice in order that the proper amount of air is supplied for combustion. The positioning of the air butterfly valve is performed by Askania equipment. When there is a change in the volume of air and gas, the resulting change in flue gas requires a change in the stack damper position in order to maintain the furnace pressure desired. This is also done by Askania equipment. In addition to the meter recording gas flow to the furnace, individual Hays indicating meters are used for the flow of gas and air to each zone.

Holding Furnace Description—The holding furnace receives the steel which has been rolled in the break-down mill. The surface of the steel entering the holding furnace is cooler than the steel in the heating furnace. The function of the holding furnace is to reheat the steel to the temperature desired for rolling to rods. The bar when entering the holding furnace

is 2½ inches square and approximately 34 feet long. Billets are end charged into the furnace which has a plastic chrome ore hearth 37 feet long by 6 feet wide. The walls are encased in steel bindings and the roof is of the same construction as the billet furnace. The controls and safety devices operate in a manner similar to those for the billet furnace.

All the main drive gear cases and pinion stands are lubricated by four DeLaval central lubricating systems, using an extreme pressure additive type oil. System A is located in one oil cellar and systems B, C, and D are located in a second cellar.

System A has a capacity of 5000 gallons and a circulating rate of 120 gallons per minute. This system lubricates the gears and bearings of the drive for the four stands of the breakdown mill, the drives for the charging and pushout mechanisms of both the billet heating and holding furnaces, the drive for the bundle conveyors, and the drive for the billet dividing shear.

System B has a capacity of 13,000 gallons and a circulating rate of 295 gallons per minute. This system lubricates the the gears and bearings of the drives and pinions for rod mill stands No. 0 to 15, inclusive.

System C has a capacity of 4500 gallons and a circulating rate of 90 gallons per minute. This system lubricates the gears, mill pinions and bearings of the drive for finishing stands No. 16 to 22, inclusive.

System D has a capacity of 900 gallons and a circulating rate of 20 gallons per minute. This system lubricates the gears and bearings of six laying reels and two pouring reels.

Each system is equipped with two oil pumps, either of which will circulate the required amount of oil with a maximum discharge pressure of 60 psi. These pumps are automatically controlled by pressure switches so that in starting the system, both pumps will run until the oil lines are full and the operating pressure is reached; then one pump will shut off and will not run unless there is a drop in line pressure of 10 psi (adjustable). By means of a manual switch, the operator is able to change the normal operation from one pump to the other.

Stencil Encyclopedia Offered

SUGGESTED marking applications and shipping data are included in the stencil section of an encyclopedia on marking, available from Pannier Corp., Pittsburgh. Also included are the various types of stencils, stencil inks and supplies available from the company.

LETTERS to the Editors...

Wants More Information

In your issue of September 5, page 84, is an article on "Copper-Base Die Alloys" by Mr. J. F. Klement. This article is of very great interest to us, as we have quite a problem with several drawing operations in steel and, if possible we would like to have the composition of the alloy referred to and fairly complete details regarding the casting practice.

G. J. Manson, M. E.
Ammunition Engineer
Canadian Arsenals Ltd.
Ottawa, Canada

We suggest that you contact the author at Ampco Metal Inc., Milwaukee 4, Wisc.—The Editors

Wire for Snow Fencing

Your name has been referred to us as a possible source of information as to addresses of any foundries or manufacturers of wire machines. We are interested in obtaining such a wire machine for the manufacture of snow fencing and corn cribbing. Whom can we contact?

William H. Fenner
2323 First Ave.
Hibbing, Minn.

A list of companies is being forwarded.—The Editors

Query on Wire Forming

We are writing for information on wire-forming and cutting machine manufacturers. Do you know of anyone making these machines?

Frank A. Holmgren
Laton Co.
Minneapolis, Minn.

List of manufacturers is being forwarded.—The Editors

OK To Reprint

May we have your permission to reprint the article. "Planned Lubrication Yields Multiple Benefits Stemming from More Efficient Machine Maintenance," which appeared in the Aug. 15, 1949 issue of STEEL? Some of our men feel it will be advantageous to them in their work.

L. J. Schmidt
Greenlee Bros. & Co.
Rockford, Ill.

Permission granted.—The Editors

Organization of Production

Please advise the writer whether STEEL has published any articles on the organization of production and if same are available. Specifically what I have in mind is a diagrammed outline or other literature showing for example, a scheduling of operations from the start to finish in the manufacture of cutting tools. The scheduling of any like product would be suitable.

H. G. Johnstin
Metallurgical Engineer
Vanadium-Alloys Steel Co.
Latrobe, Pa.

Articles, copies of which are being sent appeared in the Feb. 16, 1948, Aug. 25, 1947 Oct. 20, 1947 and Sept. 29, 1947 issues o STEEL.—The Editors

Descaling Data Sought

It is our recollection that some months ago you carried an article in STEEL on the descaling of steel blooms by a sodium hydroxide process. Our French company desires some information on this process and we would appreciate it if you would locate this article and send us a copy.

D. C. Miner, Advertising Manager
E. F. Houghton & Co.
Philadelphia, Pa.

We believe the article referred to is "Sodium Hydride Descaling", which appeared in the Nov. 13, 1945 issue of STEEL on p. 122. The descaling process is also covered in the following articles: "Descaling Stainless Steel," Nov. 19, 1945, p.120; "Descaling and Desanding Gray Iron Castings," July 15, 1946, p. 104; "Sodium Hydride Effective in Descaling Stainless Steel Sheets," April 5, 1948, p. 107; "Production of Plates," Part I, May 23, 1949. p. 114.—The Editors

Concerning Fly Ash

In your Sept. 19, 1949 issue of STEEL, on page 98, there is an article telling of a paper by Carl E. Miller discussing the problems of fly ash in the small factory. I was wondering if you could forward the information by Mr. Miller or if you could tell me where such information might be acquired.

R. E. Rooth
Maintenance Engineer
Worthington Pump & Machinery Corp.
Wellsville, N. Y.

Copies of the paper, "What Can the Small Plant Do About Fly Ash." by Carl E. Miller, technical advisor, Battelle Memorial Institute, may be obtained from Bituminous Coal Research Inc., 912 Oliver Bldg., Pittsburgh 22, Pa.—The Editors

Flow Charts for Training

If now available, I would appreciate receiving 50 copies of the Flow Chart of Raw Materials and Finished Products in 1948, which appeared in the Feb. 7, 1949 issue of STEEL on p. 100. These will be of great assistance in a training course shortly to be conducted.

H. O. Johnson
General Superintendent
American Steel & Wire Co.
Central Furnaces & Coke Works
Cleveland, O.

achment Speeds Chasing

ingle-point chasing operations in ferrous metals are speeded by overhead threading attachment ilable for universal turret lathes ie by Warner & Swasey Co., 5701 negie Ave., Cleveland 3, O. It mounted at rear of turret lathe dstock and extends a screw-adment slide tool holder to the t of the spindle. A fixed overd bar supports a counterweighted

sing bar on which a guide arm l the chasing tool arm are loed.

When the chasing tool arm is vered, a follower at headstock end chasing bar engages a leader ven by gears from the spindle to ve the bar and attached tool longitinally in accordance with pitch leader-follower combination chosen. m can be located anywhere along chasing bar, and the threading gth which can be cut at one time 4¼ inches. Pipe threading may performed with the attachment. brake is also furnished to be atched to the headstock with a belt p which surrounds the chuck, to ther speed the cycle.

Check No. 1 on Reply Card for more Details

ubricator Lengthens Die Life

Increased punching and shearing tput and lengthened die life are vantages claimed for an automatic ce-feed spray lubricator announced Manzel Inc., Buffalo, N. Y. The it, which intermittently sprays nch and shear operations with oil, thorough and produces cleaner rking and operating conditions.

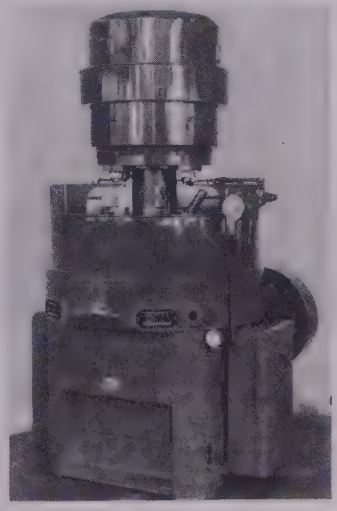
Synchronized directly with the mahines on which the unit operates, the bricators force automatically timed s of oil mist directly onto the nches, shearing edges, dies or her parts. Compressed air and oil e fed simultaneously into a sprayer zzle aimed at the critical area. The r stream has a cooling effect upon e die surfaces as well as providing lubrication. Unit may be used for large or small operations.

Check No. 2 on Reply Card for more Details

Lathe Continuous in Operation

Nonproductive indexing time is eliminated in the continuous operating No. 54 four-spindle vertical lathe manufactured by Baird Machine Co., Stratford, Conn. The compact machine measures 42⅝ x 59⅜ inches and is 76 inches high. Positioning of the work spindle before it stops rotating and a swivel joint in each holding fixture, permitting the fixture to be swung out for loading and unloading, speeds the machine's operation.

Each spindle has a set of cutting tools. Alternate spindles are set up



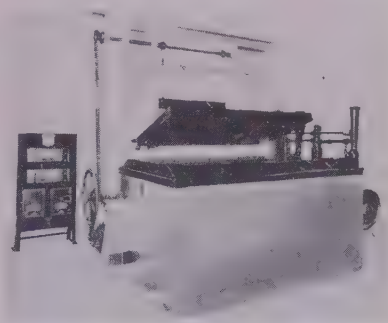
to machine two different sizes; as the spindle carrier, in which the four work spindles and four cutter bars are mounted, rotates at a speed of 15 seconds per revolution, a piece is delivered every 3.75 seconds. Total productivity is 900 pieces per hour. A micrometer adjustment is built into each cutter bar for individual adjustment when tools are resharpened. Coolant may be supplied by either an individual coolant tank or from a centralized system.

Check No. 3 on Reply Card for more Details

Salt Bath for Stainless Parts

Fired with natural, artificial or any of the liquid petroleum gases is a portable salt bath for descaling processes on stainless steel parts, made by James H. Knapp Co., 839 E. 4th St., Los Angeles 13, Calif. The I-beam based, gas-fired unit is heated by two immersion tubes equipped with air-operated eductors to insure proper travel of gases. Operation is at about 930° F.

Furnace is encased in a heavily insulated steel shell. A motor driven hinged lid covers the top and is equipped with limit switches and up and down pushbutton station. Operation may be manual, if desired. All



burners are electrically ignited and have flame failure cutouts. Heat is regulated by an automatic temperature indicating control and over-temperature cut-out.

Check No. 4 on Reply Card for more Details

Box Facilitates Handling

Release of two locking pins on the Trans-A-Box, made by Production Accessories Co., 123 East Goldengate Ave., Detroit 3, Mich., allows the unit to fold quickly to 25 per cent of its former bulk, thus eliminating storage and shipping problems. Box is built of heavy gage, expanded metal, supported by a steel framework.

It requires no liners and is arc welded throughout. There is an unobstructed 4-inch entry all around the base for handling.

Check No. 5 on Reply Card for more Details

Rigidized Tubing Offered

Process for rolling textured patterns in flat metal which redistributes the metal through the cross section, thus increasing the stiffness, strength and impact value as well as producing attractive patterns, is being applied to tube manufacture by Standard Tube Co., 24400 Plymouth Rd., Detroit, Mich. Made under agreement with Rigidized Metals Corp., Buffalo, N. Y., the carbon steel tubing is made from strip into which the patterns have been rolled by forming and resistance welding. Where weight-strength ratio is a factor, lighter materials may be used.

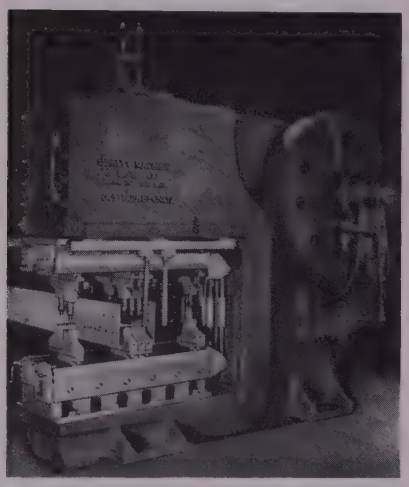
No polishing of the tubing for electroplating is necessary, the fine surface defects being hidden by the reflection of light from the patterned

material. Often the copper plating can be eliminated before nickel and chromium. At present, four patterns are being produced, in sizes from ½ to 5½ inches OD, 16 Birmingham wire gage (0.065-inch) to 22 BWG (0.028-inch). Squares, rectangles and other special shapes are available. It can be furnished in stainless steel, as well as mild carbon steel and low alloy high tensile steels.

Check No. 6 on Reply Card for more Details

Punch Tools for Quick Setup

Quick initial setup and instantaneous shifting of punch and die positions to pick up off-gage-line holes are possible with an adjustable set of punch tools for punching webs of beams and channels, angles and



plates, made by Beatty Machine & Mfg. Co., Hammond, Ind. Punch and die units move together as a unit, with movement controlled by a hand crank. It fits any Beatty toggle beam punch.

Check No. 7 on Reply Card for more Details

Self-Propelled Arc Welder

Equipped to go to a job under its own power and make on-the-spot repairs with arc welding, oxyacetylene welding and cutting and power tools is the movable Weldmobile, made by

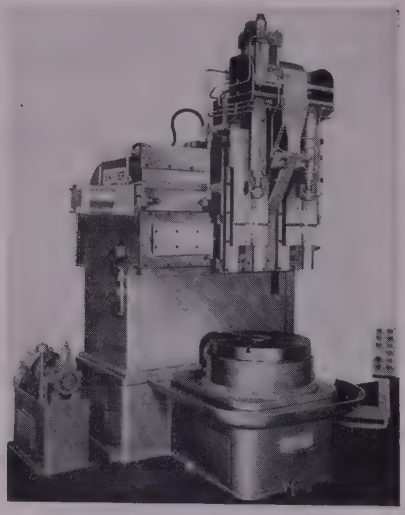
Hobart Brothers Co., Box 389, Troy, O. Two models are being produced, the GR-301-M with a 300 amp welder for light to heavy welding requirements and the GR-401-M with a 400 amp welder for medium to extra heavy requirements.

Either unit can be furnished with a 1 or 3 kw auxiliary direct current power for lights and power tools. A universal coupler is provided to permit towing of additional equipment.

Check No. 8 on Reply Card for more Details

Vertical Hydraulic Lathe

Designed to develop maximum efficiency from the use of carbide tooling is a special heavy-duty vertical hydraulic lathe, built by Snyder Tool & Engineering Co., Detroit, Mich. It is adaptable to facing, boring or turning a variety of large work pieces



by changing fixtures and tool holders. The vertical welded steel column carries a hydraulically operated, horizontal cross slide upon which are mounted two hydraulically operated vertical tool slides.

Each tool slide is equipped with T-slots and keyways for mounting tool blocks and holders. Horizontal slide has a 21-inch stroke and vertical slides have 14-inch strokes. A 30-inch variable speed, rotating table is mounted on the base and is equipped with T-slots and pilot for mounting fixtures or chucks. Machine can be set for various combinations of automatic cycling.

Check No. 9 on Reply Card for more Details

Die Checker is Semiautomatic

Means for fast and accurate visual gaging of contour profiles, flash and striking surfaces of forging dies and punches is provided by the Pant-O-Scriber die checker developed by Engineers Specialties Div., Universal Engraving & Colorplate Co. Inc., 980 Ellicott St., Buffalo 8, N. Y. As a tracer moves across the die in the X plane, a scribing cutter on the other end of the tracer arm duplicates the movements and in so doing cuts scribes the colored film from Pant-O-Scriber glass. The arm is a mounted on a cross beam in the plane, providing an accurate f movement in both X and Y plan

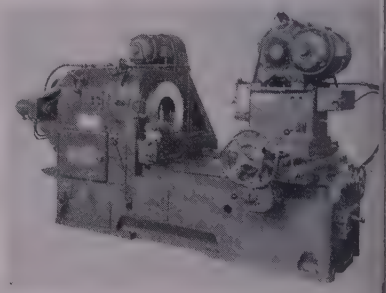
As the arm is indexed to the seco gaging position, determined by ga block settings, the glass is also dexed and the second of up to ni sections is scribed on the same gla Glass plate is placed on the meas ing stage of a Vu-graph Delineasco

in register with a master chart. Bo chart and glass are in proper fo plane and both are projected o screen. Die contour and master, contrasting colors, are in true re tionship to each other as projected the screen. Machine will accommod die blocks weighing up to 800 poun and sizes up to 12 x 14 x 22 inch

Check No. 10 on Reply Card for more Det

Miller for Various Threads

Threads may be milled to the cl est tolerances on the lead, for pitch diameter and finish with t No. 30 Smalley general thread mill



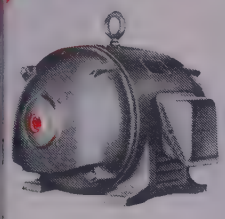
manufactured by Wickes Brothe Division of Wickes Corp., Sagina Mich. Machine employs a multi ring tooth cutter for milling straig and tapered, inside and outside, rig and left hand threads. A taper

There's a Century MOTOR To Supply Dependable Power For All Popular Applications

Century motors are available in sizes from 1/6 to 400 horsepower, in a wide range of types and kinds — single phase and polyphase alternating current, and direct current. All of them are ruggedly built to assure top performance throughout a long service life.

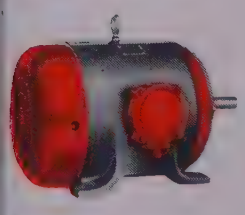
POLYPHASE

Type SC—OPEN PROTECTED—Form J, general purpose motor—meets the needs for most installations where operating conditions are relatively clean and dry. The top half of the motor frame is closed to keep out falling solids or dripping liquid.



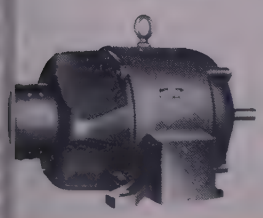
Type SC—SPLASH PROOF—gives the necessary protection where plants must be washed down—keeps water out of the motor even when a hose is applied directly on the frame. Also provides protection against rain, snow, sleet and ice for outdoor installations.

Type SC—TOTALLY ENCLOSED FAN COOLED—protects against dusts, mist or fog detrimental to the vital parts of the motor. The inner frame protecting the motor is sealed to keep out harmful matter.



Type SC—EXPLOSION PROOF protects against atmospheres charged with explosive dusts or gases. They carry Underwriters' label for specific kinds of hazards.

Type SR—SLIP RING– wound rotor motors are suitable for applications requiring low starting current with high starting torque, reversing, or adjustable speed.

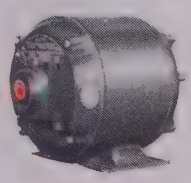


Type SY—SYNCHRONOUS MOTORS- suitable for continuous operation at a uniform load for power factor correction.

SINGLE PHASE

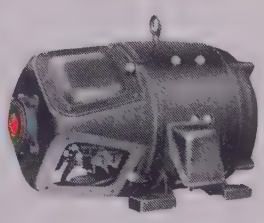
Type RS—REPULSION START INDUCTION—single phase brush lifting motor suitable for applications requiring high starting torque with low starting current.

Type CSH—CAPACITOR START INDUCTION—single phase motor suitable when high starting torque with normal starting current is required.



Type SP—SPLIT PHASE, INDUCTION—single phase motors—suitable for light starting duty.

DIRECT CURRENT



Type DN—DIRECT CURRENT MOTORS—suitable for use where direct current is available or its use desirable.

These illustrations are typical of Century's complete line of motors. Others available include gear motors, generators, AC and DC motor generator sets.

Specify the right Century motor for all your electric power requirements.

Popular types of standard ratings are generally available from factory and branch office stocks.

CENTURY ELECTRIC COMPANY

1806 Pine Street
St. Louis 3, Missouri

Century C MOTORS

Offices and Stock Points in Principal Cities

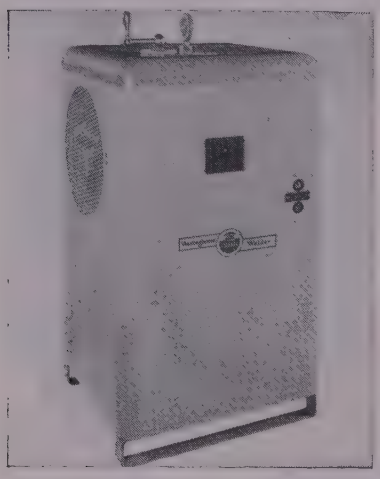
to 4 inches per foot and a range of 1 to 28 threads per inch are possible.

Large diameter work is handled with the 10½ or 15½-inch hydraulically operated 3-jaw wedge chuck. It may be equipped with a 4-jaw independent chuck or a face plate with boring mill jaws. Factors contributing to high production rate are rigid construction, a range of milling spindle speeds from 50 to 300 rpm and a range of main spindle speeds from 1.52 to 41 rpm for milling and 3.08 to 83 rpm for turning.

Check No. 11 on Reply Card for more Details

DC Welder Has Low Load Loss

The no-load loss in a 300 amp direct current plate-type rectifier welder is 500 watts, according to Westinghouse Electric Corp., Pittsburgh 30, Pa. These new welders are rated in accordance with NEMA standards for



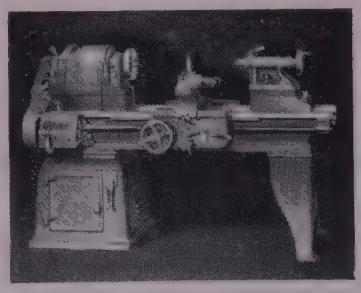
industrial type, single-operator, arc welders and are available in 200, 300 and 400 amp ratings.

Major components of the new type welders are three-phase welding transformer, three-phase adjustable reactor and a plate-type selenium three-phase, full-wave rectifier. Efficiency at full load is 66 per cent, increasing at reduced load conditions to 73 per cent at 20 per cent rated load. A simple terminal board provides means of connecting the welder for 220 or 440-v operation.

Check No. 12 on Reply Card for more Details

16 Spindle Speed Lathe

The 16 spindle speeds ranging from 11 to 727 rpm on the 24-inch swing lathe made by South Bend Lathe Works, 390 E. Madison St., South Bend 22, Ind., suit it for machining large diameter work that is not excessively heavy and within the capacity of the machine. Maximum swing over saddle cross slide with chip guard is 18¾ inches and without chip guard, 19¼ inches. Distance between centers varies from 30 to 102 inches, depending upon bed length. Power longitudinal cross-feeds range from 0.0015 to 0.0841-



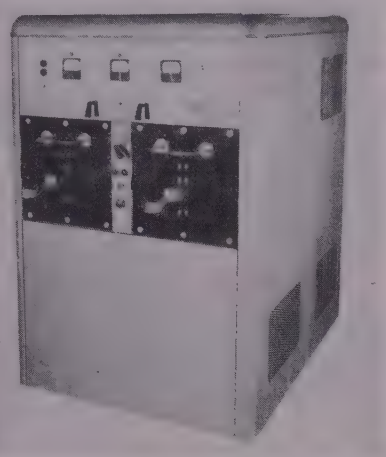
inch and cross-feeds from 0.0006 to 0.0312-inch.

Full quick change gear mechanism provides 48 pitches of screw threads ranging from 4 to 224 per inch, left or right hand. A two-speed motor transmits the power by belt to the headstock cone pulley. Slow speeds are driven through back gears.

Check No. 13 on Reply Card for more Details

Induction Heating Unit

A manually operated tap switch allows the operator to compensate for line voltage changes in an induction heating unit produced by High Frequency Heating Division, Lindberg Engineering Co., 2444 W. Hub-



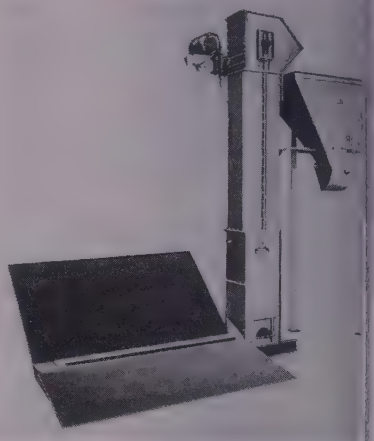
bard St., Chicago 12, Ill. Type LI-25 unit has rated output of 25 kw at 100 per cent duty cycle with a normal frequency of 450,000 cycles per second. They are available for use with 230, 460 and 550 v, 3 phase, 60 cycle power.

A closed system circulates temperature-controlled distilled water through water-cooled components. Transformers automatically control filament voltages. Indicating lamps reveal abnormal conditions at any one of the protective devices. Stan ard equipment includes a synchr ous timer with vernier heat cy adjustment and additional circuits control two other operations su as quench, fixture movement, Unit is offered with one or two wo ing stations.

Check No. 14 on Reply Card for more Det

Sand Handling System

Requiring no pit or foundation packaged unit foundry sand handli system for individual floors, ma by Newaygo Engineering Co., Ne aygo, Mich., drops sand directly i the flask with the pulling of an ov head handle. Conditioned sand deposited over the feeder or can



discharged onto the feeder from portable sand conditioner. The fee delivers sand to a bucket eleva which carries it up to an aera at the top, which discharges rea to-use sand into a hopper.

As the hopper becomes empti the molder pushes a button to re it from the heap. One motor op ates the entire Handy Sandy u Headroom requirements are low. tional equipment includes a ha draw bin.

Check No. 15 on Reply Card for more Det

Boring Head for Turret Lathe

Manufactured in three sizes use in any type of boring mach or turret lathe is the offset bor head of Everede Tool Co., 2 N. Parkside Ave., Chicago 39, A direct-reading fraction type assures accurate adjustment. By h ing the lead screw off-center of head, it is possible to adjust length of the boring bars for shall or deep hole boring.

Extension attachments furnish for the larger and intermediate s heads increase their capacity 50 cent. Facing operations are perfor with the use of a removable col

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So we took it from there.

Developed aluminum alloys with the needed combination of strength and corrosion-resistance. Designed aluminum shapes just right for window frames, bought big presses to squeeze them out like toothpaste from a tube. Pioneered welding methods and fasteners to assemble them. We advertised these things year after year to window manufacturers and buyers.

Last year, over a million aluminum windows went on the job to end window troubles. Because we backed an idea with the investment that makes Alcoa Aluminum a good buy. ALUMINUM COMPANY OF AMERICA, 2115X Gulf Building, Pittsburgh 19, Penna. Sales offices in principal cities.

ALCOA **FIRST IN ALUMINUM**
THE METAL THAT LASTS

available for each size head. Collar has retractable pins which permit either a 0.0025 or 0.005-inch feed per revolution. All of the heads utilize the jig boring bars equipped with triangular tool bits of solid carbide, tantung, stellite or high speed steel.

Check No. 16 on Reply Card for more Details

• • •

SHOP CONVEYOR: Available in 6 and 8 foot lengths, a new Pressman shop conveyor is offered by Arrow Products Inc., Grand Rapids, Mich. The 12-inch pliable belt is three ply fabric, impregnated with Neoprene rubber, resistant to water, grease, dirt, oil and abrasion from sharp metal objects.

Check No. 17 on Reply Card for more Details

SLOT NUTS: Slot nuts of a special alloy bronze with threads that will not bind on the studs and will not strip are offered by Hardware Mfg. Co., Bridgeport 4, Conn. Nuts are offered in eight sizes: ½-inch for ½-inch studs, ⅝-inch for ⅝-inch studs, ¾-inch for ¾-inch studs, ⅞ inch for ⅞ and ¾-inch studs, 1-inch for 1, ⅞, ¾-inch studs.

Check No. 18 on Reply Card for more Details

PURIFIER: Type RA line purifier which removes oil, water, pipe scale, rust and sediment from compressed air and steam lines is introduced by Centrifix Corp., Cleveland 15, O. It is designed for use in horizontal or vertical downflow position on steam lines up to 400 pounds gage and 650° F and for compressed air or gas not exceeding 800 pounds gage and 100° F nonshock service.

Check No. 19 on Reply Card for more Details

UPENDER DEVICE: Turning heavy cylindrical items 90 degrees from horizontal to vertical or vice versa, is easily accomplished by an upending device for use with fork lift trucks. Made by Clark Equipment Co., Battle Creek, Mich., it is available for both gas and electric Clark fork-lift trucks of 2000-pound capacity.

Check No. 20 on Reply Card for more Details

PACKING MATERIAL: Crane Packing Co., Chicago, Ill., announces that its new chemically inert packing material, Chemlon, is now available in molded form in a wide variety of shapes. It is not attacked by any acids or alkalis and is effective to temperatures of 450° F.

Check No. 21 on Reply Card for more Details

CAST IRON VALVE: Type No. 709, a 30-inch 50-pound cast iron valve equipped with 125 pound flanges and a renewable one-piece rubber seat for positive shut off, is offered by R-S Products Corp., Philadelphia 44, Pa. It is air bubble tight at 80 psi and drip tight with water at 100 psi.

Check No. 22 on Reply Card for more Details

GRINDING CHUCK: Abrasive Associates, Providence 3, R. I., developed a new type of segmental grinding chuck that in basic design is standardized so that two sizes of abrasive segments cover all grinding wheel requirements for vertical and horizontal spindles, face grinders.

Check No. 23 on Reply Card for more Details

WATERPROOF SWITCH: Model ES-14 switch for actuating electric counters is introduced by Production Instrument Co., Chicago 6, Ill. Switch arm is operated by a 1-inch diameter rubber wheel.

Check No. 24 on Reply Card for more Details

POWER BRUSH: For scrubbing strip and sheet steel, a new Master rotary brush has been developed by Osborn Mfg. Co., Cleveland, O. It is produced in units in lengths from 4 to 22 inches and in diameters from 8 to 12 inches with larger diameters available if desired.

Check No. 25 on Reply Card for more Details

WELDING CLAMP: Pro-Clamp was created to hold plates, bars, tubing, etc., while parts are being united by welding, brazing or soldering. Made by Bernard Welding Equipment Co., Chicago 19, Ill., clamps are rotatably mounted and can be preset at any angle from 0 to 180 degrees.

Check No. 26 on Reply Card for more Details

LUBRICANT: Die Slick No. 9 is a new lubricant for pressure die casting dies which may be applied with brush or spray. Made by G. W. Smith & Sons Inc., Dayton 3, O., it is nontoxic and leaves no carbon, gum or other residue in the die.

Check No. 27 on Reply Card for more Details

CONTROL INSTRUMENTS: A new line of air operated control instruments, designated as series 500 controllers, are offered by Bristol Co., Waterbury, Conn. Included are controllers for automatically controlling temperature, pressure, flow, liquid level, humidity and pH value.

Check No. 28 on Reply Card for more Details

DC MOTOR: A 1/100-hp dc motor that can be used for any type of application requiring linear or rotary motion is offered by Electro-Aire Inc., North Hollywood, Calif. Running torque is 1 inch ounce at 10,000 rpm, 28 v but is adaptable to other torque a speed requirements.

Check No. 29 on Reply Card for more Det

SOLDERING DEVICE: Stern Co Pittsburgh, Pa., introduces the Sold Matic, a new soldering device t automatically feeds solder to the of the iron. Feeding attachment v fit any standard electric solderi iron from 75 to 250 w and can h more than 6 feet of solder from 1/ to 3/16-inch diameter.

Check No. 30 on Reply Card for more Det

SAFETY VALVE: Known as P tectomatic valve, a high press hydraulic throttle type valve has be developed by R. D. Wood Co., Phi delphia, Pa. Used to control falli speed of weighted type accumulato valve acts as an automatic prot tive device in preventing an accun lator tank or platform from crashi on its bumper blocks.

Check No. 31 on Reply Card for more Det

FITTING: Swagelok, a new fitti for use with any type of metal plastic tubing, has been developed Crawford Fitting Co., Cleveland O. It provides leakproof seals three points. Fitting is slipped or end of a tube and given one a one quarter turns with a standa wrench.

Check No. 32 on Reply Card for more Det

SPEED DRIVE: An infinitely va able speed transmission designed small conveyors is announced by G ham Transmissions Inc., Milwauk 12, Wis. Known as model 20M drive delivers all speeds from the sired maximum down to zero a will handle small conveyors usua driven with ¼ or ⅓-hp motors.

Check No. 33 on Reply Card for more Det

PANELBOARD: Designed to provi economical group and branch circ control of lighting distribution all industrial and commercial appli tions, the NTPR panelboard is fered by Trumbull Electric Mfg. C Plainville, Conn. It is available 6 to 42 circuits and will fit standa stud walls without projections.

Check No. 34 on Reply Card for more Det

FOR MORE INFORMATIO
on the new products and equipme in this section, fill in a car It will receive prompt attentio

Helpful Literature

Blast Cleaning Equipment

acu-Blast Co.—8-page illustrated
ler "Vacu-Blaster, the Modern
sting Method" deals with equip-
t for cleaning steel, masonry and
er surfaces without dirt or dust
continuous blasting, cleaning and
aiming operations. Equipment
sists of blasting gun, abrasive
arator, pressure generator and
t arrester.

Abrasion-Resistant Alloy

lectro-Alloys Div., American
ke Shoe Co.—6-page illustrated
ular T-176 is entitled "How To
luce Abrasive Wear with Ther-
loy HC-250." It describes physi-
properties of alloy material which
high abrasion and heat resist-
e and good machinability. Ac-
field service data on alloy's ap-
ation are given in form of case
ories.

Hydraulic Turbine Care

llis-Chalmers Mfg. Co.—12-page
strated bulletin 02B7226 is entitled
evention and Reduction of Cavita-
and Pitting in Hydraulic Tur-
s." No. 11 of series on current
ds in power plant development,
lication explains and discusses
tation in water as it applies to
raulic turbines. Applicable basic
nulas are elaborated upon, and
tive merits of avoiding cavitation
inimizing its effects are present-

Speed Reducers

leveland Worm & Gear Co.—8-
e illustrated bulletin "Save Space
Save Weight . . . Save Money"
eries of case studies on use of
edaire fan-cooled worm gear speed
cers and resultant savings. Per-
nance data are given on applica-
s of drives to machine tools, proc-
equipment, elevators, conveyors
pumps.

Fabricated Alloy Fixtures

rown-Hutchinson Iron Works—8-
e illustrated brochure "Engineered
ipment" gives performance case
ories of specially designed alloy
s, shaker hearths, work boxes,
a trays, carriers and other fixtures
furnace, heat treating, pickling,
nical, and pulp and paper applica-
s.

Pneumatic Tools

leco Div., Reed Roller Bit Co.—
age illustrated catalog No. 47 pre-
s complete information on rivet-
chipping, caulking and scaling
mers; sand rammers; backfill
pers; weld-flash scalers; drills;
ners; tappers; nut setters; screw-
ers; grinders; sanders; buffers;
ry file and burr machines; and
r pneumatic tools and accessories.

80. Converters & Generators

Kato Engineering Co.—4-page illustrated form 549-MG describes Katolight converters, motor-generators and high frequency generators. Several models of each type are illustrated and applications, features and capacities listed.

81. Helical Gear Drives

Foote Bros.—16-page illustrated engineering manual MPA gives data on Maxi-Power enclosed helical gear drives in single, double and triple reduction types. Space is devoted to service factors, load characteristics, ratings and selection factors.

82. Ladle Equipment

Whiting Corp.—40-page illustrated bulletin FY-163 describes line of ladle equipment. Bulletin contains 53 photographs, 25 drawings and 25 specification tables of interest to iron and steel production men.

83. Hand Chain Hoist

Harrington Co.—4-page illustrated bulletin P-5 features Peerless Packet hand chain hoist available in ½ and 1-ton capacities. Component parts of hoist are described in cutaway drawing; and all dimensions, prices and operating features are reported.

84. Industrial Lubricants

Tide Water Associated Oil Co.—24-page illustrated brochure "Lubricania" highlights most important qualities of lubricants, giving tests employed in their identification and explaining briefly meaning and value of each of these characteristics. Lubrication glossary defines words and expressions used primarily in petroleum industry.

85. Magnetic Separators

Dings Magnetic Separator Co.—8-page illustrated catalog No. C-5000A describes electric and nonelectric magnetic pulleys, drums, triple-pole rectangular magnets, lifting magnets, nonelectric plate magnets and various other equipment. Data include specifications, list of applications and features of equipment.

86. Threading Stainless Steel

Cooper Alloy Foundry Co.—Illustrated folder entitled "Don't Fear Threading of Stainless" is designed to show that properly trained personnel, using selected equipment can thread and tap stainless steel at high production rates. Actual case studies are included which give speeds, tool angles, coolants and other data.

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8	28	48	68	88
9	29	49	69	89
10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
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Penton Building, Cleveland 13, Ohio

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87. Corrosion-Resisting Alloys

Duriron Co. — 12-page illustrated general catalog M condenses data published in 54 separate bulletins on corrosion-resisting equipment and alloys. It covers Duriron, Durimet 20, Durichlor, D-10, Chlorimet 3 and Chlorimet 2, with composition and physical, mechanical and special characteristics listed. Equipment includes anodes, bar, ejectors, fans, heaters, pipe and fittings, pumps, kettles, condensers, sinks, tanks, and 16 types of valves.

88. Steel Doors & Frames

American Welding & Mfg. Co., Building Products Div.—8-page illustrated A.I.A. file No. 16-A contains architect's specifications, construction details, dimensions and other pertinent information on Amweld steel doors, frames and sliding closet units.

89. Floor Resurfacer

Monroe Co. — 4-page illustrated folder on Swift-Floor plastic floor repairing or resurfacing material points out how floors are ready for traffic 1 minute after this compound is applied. Guaranteed to stand loads up to 50,000 lb, material bonds permanently to concrete or plank floors and will not crack, crumble or curl.

90. Ball Bearings

Marlin-Rockwell Corp. — 40-page bulletin No. 26 organizes numbers of over 12,500 ball bearings of various makes in numerical order and lists corresponding sizes of M-R-C replacements. Publication is intended to aid shop man in identifying majority of ball bearings he may encounter in his work and be helpful in making service replacements.

91. Blast Cleaning Equipment

American Wheelabrator & Equipment Corp.—4-page illustrated industry report No. 534 on use of airless Wheelabrator blast cleaning machine shows installations for cleaning both new pipe and pipe that has been taken from ground and is being reconditioned. Metallic abrasive hurled against pipe provides slightly roughened, thoroughly clean surface for subsequent coating.

92. Telemetering Systems

General Electric Co.—20-page illustrated bulletin GEA-5233 gives detailed information on telemetering equipment for electric power distribution and industrial applications. Frequency, torque-balance and photo-electric types are described; and simple wiring diagrams are included.

93. Industrial Products

Steel Products Engineering Co 24-page illustrated brochure depi history of company, facilities manufacturing wide range of ind trial products, special machinery a testing equipment.

94. Card Punch

International Business Machi Corp.—6-page illustrated form 52-5719-1 describes IBM card pun that can be obtained in nonprinti or printing model for simultaneo interpreting of information punch in cards.

95. Feedwater Deaeration

Cochrane Corp.—35-page illustr ted catalog No. 3005 explains i portance of deaeration to feedwat chemistry. Complete description equipment designed for this trea ment and article entitled "The Ro of Alkalinity in Preventing Cor sion" are included also.

96. Air-Setting Bonding Mort

Quigley Co.—4-page illustrated b letin No. 322F deals with Q-Chro flame and slag resistant air-setti chrome-base bonding mortar which suitable for hot patching and rev beratory drossing, and use on op hearths and anode and refining fu naces.

97. Industrial Wire Cloth

Buffalo Wire Works Co.—4-pa illustrated form No. 594 explains ho all types of industrial wire cloth a woven, processed, finished, die-c bound and fabricated into complet products for processing gun powd chemicals, abrasives and mineral a gregates, and making conveyor bel

98. Aluminum Ladders

Aluminum Ladder Co.—12-page lustrated folder entitled "Alco-L Aluminum Ladders for Industry" d scribes various aluminum ladders f industrial use. Included are foldi step, warehouse and straight ladde Weights and specifications are giv also.

99. Rustproofing Chemical

American Chemical Paint Co.— page illustrated pocket-size pamphl form No. 704 discuses Thermo Granodine which forms extreme dense protective phosphate coating steel to promote resistance to corr sion and wear; prevent scoring, scu ing and galling; and provide go base for paint.

100. Corrosion Service Piping

Taylor Forge & Pipe Works—3 page illustrated bulletin 485 is co prehensive treatment on stainle steel and nickel alloy anticorrosi and anticontamination piping. Eco omics, standards, advantages of wel ing, technical data and complete d mensional information on stainle fittings and flanges are included.

FOR MORE INFORMATION USE ONE OF THESE CARDS . .

STEEL Numbers

1	21	41	61	81
2	22	42	62	82
3	23	43	63	83
4	24	44	64	84
5	25	45	65	85
6	26	46	66	86
7	27	47	67	87
8	28	48	68	88
9	29	49	69	89
10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

STEEL 10-24-49

Penton Building, Cleveland 13, Ohio

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Market Summary

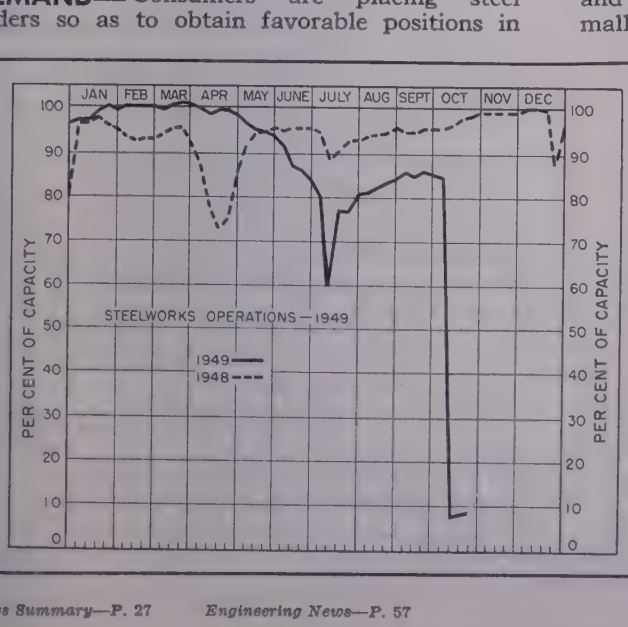
FOURTH week of the steel strike finds metalworking slowing down at a faster pace though still in relatively high gear. Most fabricators are maintaining operations close to pre-strike levels, living off inventories. A few shops are strike-bound, and only a few others have been forced to close or curtail for lack of steel. Certain manufacturers have enough metal for another three or four weeks. Some of them are turning to substitutes, such as aluminum. This latter metal, however, also may be in tight supply soon because of strikes at a number of Aluminum Co. of America plants. In the main, fabricators' prospects are bleak with steel stocks shrinking alarmingly. Unless the strike is quickly ended, general contraction of metalworking is expected by Nov. 1. Even automotive shops that held comfortable steel supplies at the strike's start will be pinched by that time. They already are preparing to cut operations by mid-November.

LABOR—Faint hope for early ending of the strike rests on efforts of government mediators to lay the groundwork for a settlement. But no end of the walkout was in sight late last week. Some steelmakers are beginning to stagger clerical employment, indicating they anticipate no early termination of the dispute. Most labor experts think the government will actively intervene in the dispute once fabricating industry begins to come to a grinding halt. Meanwhile, union policy for closing metalworking shops is vague. Some fabricators have been struck but others have had their contracts extended indefinitely.

OPERATIONS— Steelworks not closed by the strike are pushing production to the limit under ever-mounting consuming demand. The national ingot rate went up 1½ points last week to 9½ per cent of capacity.

DEMAND— Consumers are placing steel orders so as to obtain favorable positions in rolling schedules when the mills resume production. Acute shortages are anticipated in some items, especially flat-rolled, into 1950 as result of strike loss of close to 5 million tons of steel by the end of this week. This loss may never be recovered and may possibly back up deliveries well into first quarter. It is expected in some circles consumers will rush to replenish depleted inventories immediately following strike settlement and force producers to ration some products. On the other hand, a note of apprehension for the future is creeping into the picture. Even after full-scale steel production is resumed snowballing effect of metalworking curtailments cannot be checked immediately. Some shops will require weeks to regain their pre-shutdown stride. Further, the impact of the strike on purchasing power is cause for concern.

PRICES—Uncertainty over the steel price trend is in evidence. First quarter advances are anticipated by some buyers, especially should the union's pension and insurance demands be met. Meanwhile, the market is holding unchanged and no immediate revision in schedules is in sight. Some gray market offerings are appearing but consumers are shying away from them. An important development the past week was shelving of basing point legislation until Congress reconvenes in January. The House passed a conference report but it was stymied in the Senate. STEEL's finished steel weighted index held steady last week at 152.52 and compared with 151.86 a year ago. The arithmetical composite also was unchanged at $91.64 and compared with $95.05 last year. Reflecting downward appraisal of the market by brokers, the steelmaking scrap composite eased to $26.17 from $26.75 and compared with $43.25 a year ago. Pig iron composites held steady and compared with last year as follows: Basic, $45.60 and $46.29; No. 2 foundry, $46.10 and $46.50; malleable, $47.27 and $47.20.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Oct. 22	Change	Same Week 1948	Same Week 1947
Pittsburgh	3.5	None	97	104
Chicago	5	None*	98.5	95
Eastern Pa.	8.5	None	95	91.5
Youngstown	0	None	104	92
Wheeling	61	+ 1.5	91	93.5
Cleveland	0	None	99	90
Buffalo	0	None	104	88.5
Birmingham	6	None	100	99
New England	55	+ 3	87	84
Cincinnati	52	+ 6	103	87
St. Louis	84.5	— 5	89.5	74
Detroit	37	+10*	98	86
Western	21	None	..	..
Estimated national rate	9.5	+ 1.5	98.5	95.5

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. *Change from revised rate.

Composite Market Averages

	Oct. 20 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	152.52	152.52	152.52	151.86	99.16
Index in cents per lb ..	4.132	4.132	4.132	4.114	2.686
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$91.64	$91.64	$91.55	$95.05	$56.73
No. 2 Fdry Pig Iron, GT	46.10	46.10	46.10	46.50	23.67
Malleable Pig Iron, GT..	47.27	47.27	47.27	47.20	24.29
Basic Pig Iron, GT.....	45.60	45.60	45.60	46.29	23.00
Steelmaking Scrap, GT..	26.17	26.75	27.08	43.25	16.33

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Oct. 20 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pitts.	3.35	3.35	3.35	3.35–55	2.15
Bars, H.R., del. Phila.	3.83	3.83	3.83	3.79	2.47
Bars, H.R., Chicago	3.35	3.35	3.35	3.35	2.15
Bars, C. F., Pitts.	3.95-4.00	3.95-4.00	3.95-4.00	3.95-4.25	2.65
Bars, C.F., Chicago	4.00	4.00	4.00	4.00	2.65
Shapes, Std., Pitts.	3.25	3.25	3.25	3.25–30	2.10
Shapes, Std., Chicago	3.25	3.25	3.25	3.25	2.10
Shapes, del. Phila.	3.50	3.50	3.50	3.48	2.215
Plates, Pittsburgh	3.40	3.40	3.40	3.40–60	2.10
Plates, Chicago	3.40	3.40	3.40	3.40	2.10
Plates, Coatesville, Pa.	3.50	3.50	3.50	3.75	2.10
Plates, Sparrows Point, Md.	3.40	3.40	3.40	3.45	2.10
Plates, Claymont, Del.	3.50	3.50	3.50	3.95	2.10
Plates, del. Phila.	3.59	3.59	3.59	3.71	2.15
Sheets, H.R., Pitts.	3.25	3.25	3.25	3.25–30	2.10
Sheets, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Sheets, C.R., Pitts.	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Chicago	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Detroit	4.20	4.20	4.20	4.20	3.15
Sheets, Galv., Pitts.	4.40	4.40	4.40	4.40	3.50
Strip, H.R., Pitts.	3.25	3.25	3.25	3.25–70	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25–30	2.10
Strip, C.R., Pitts.	4.00	4.00	4.00	4.00–75	2.80
Strip, C.R., Chicago	4.00–15	4.00–15	4.00–15	4.00–25	2.90
Strip, C.R., Detroit	4.20–25	4.20–25	4.20–25	4.20–50	2.90
Wire, Basic, Pitts.	4.15	4.15	4.15	4.15-4.50	2.60
Nails, Wire, Pitts.	5.15	5.15	5.15	5.15-6.30	2.55
Tin plate, box, Pitts.	$7.75	$7.75	$7.75	$6.80	$5.00

SEMIFINISHED

Billets, forging, Pitts.(NT)	$61.00	$61.00	$61.00	$61.00	$40.00
Sheet bar, mill(NT)	51.78–52.00	53.57–52.00	53.57–52.00	67.00	34.00
Wire rods, ½-⅝", Pitts.	3.40	3.40	3.40	3.40–4.15	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$24.50
Basic, Valley	46.00	46.00	46.00	46.00	23.50
Basic, del. Phila.	49.44	49.44	49.44	50.17	25.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	43.00-46.50	24.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, del. Phila.	49.94	49.94	49.94	50.67	25.84
No. 2 Fdry, Birmingham	39.38	39.38	39.38	43.38	20.38
No. 2 Fdry.(Birm.)del Cin.	46.08	46.08	46.08	49.09	24.06
Malleable, Valley	46.50	46.50	46.50	46.50	24.00
Malleable, Chicago	46.50	46.50	46.50	43.50-46.50	24.00
Charcoal, Lyles, Tenn.	60.00	60.00	60.00	62.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	163.00	135.00

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts.	$29.00	$29.75	$29.75	$42.75	$17.25
No. 1 Heavy Melt. E. Pa.	24.00	25.00	25.00	45.25	15.50
No. 1 Heavy Melt. Chicago	25.50	25.50	26.50	41.75	17.50
No. 1 Heavy Melt. Valley	31.25	31.25	31.25	42.75	16.25
No. 1 Heavy Melt. Cleve.	26.50	26.50	26.50	42.25	16.25
No. 1 Heavy Melt. Buffalo	28.25	28.25	28.25	48.50	16.75
Rails, Rerolling, Chicago	41.50	41.50	41.50	66.50	22.25
No. 1 Cast, Chicago	41.50	41.50	41.50	70.50	20.00

COKE, Gross Ton

Beehive, Furn., Connlsvl.	$13.25	$13.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl.	15.75	15.75	15.75	17.00	7.75
Oven, Fdry, Chicago	20.00	20.00	20.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	17.625	17.625	17.625	23.50	12.00
Zinc, E. St. Louis	9.25	9.25	10.00	15.50	8.25
Lead, St. Louis	12.80	13.55	14.925	19.30–35	6.35
Tin, New York	95.75	95.875	103.00	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	17.00	15.00
Antimony, Laredo, Tex.	32.00	32.00	38.50	38.50	14.50
Nickel, refinery, duty paid	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark,del.	50.63	51.13	51.63	52.13
Brooklyn,N.Y.,del.	....	52.79	53.29	....
Birmingham District				
Birmingham,Ala. R2, S9	38.88	39.38	....	....
Woodward,Ala. W15	38.88	39.38	....	....
Cincinnati,del.	....	46.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda,N.Y. W12	46.00	46.50	47.00	....
N.Tonawanda,N.Y. T9	....	46.50	47.00	....
Boston,del.	55.26	55.76	56.20	....
Rochester,N.Y.,del.	48.63	49.13	49.63	....
Syracuse,N.Y.,del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary,Ind. C3	46.00	....	46.50	....
IndianaHarbor,Ind. I-2	46.00	....	46.50	....
So.Chicago,Ill. W14	46.00	46.50	46.50	....
So.Chicago,Ill. C3	46.00	....	46.50	47.00
So.Chicago,Ill. Y1	46.00	46.50	46.50	....
Milwaukee,del.	47.89	48.39	48.39	48.89
Muskegon,Mich.del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Lorain,O. N3	46.00	....	....	47.00
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Duluth I-3	....	....	46.50	....
Erie,Pa. I-3	46.00	46.50	46.50	47.00
Everett,Mass. E1	....	50.50	51.00	....
Geneva,Utah G1	46.00	46.50	....	....
Seattle,Tacoma,Wash.,del.	....	54.20	....	....
Portland,Oreg., del.	....	54.20	....	....
LosAngeles,SanFrancisco,del.	53.70	54.20	....	....
GraniteCity,Ill. M10	47.90	48.40	48.90	....
St.Louis,del.(incl. tax)	48.65	49.15	49.65	....
Ironton,Utah C11	46.00	46.50	....	....
Minnequa,Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	46.00	46.50	46.50	47.00
Pitts.N&S sides,Ambridge, Aliquippa,del.	47.19	47.69	47.69	48.19
McKeesRocks,del.	46.95	47.45	47.45	47.95
Lawrenceville,Homestead, McKeesport,Monaca,del.	47.44	47.94	47.94	48.44
Verona,del.	47.90	48.40	48.40	48.90
Brackenridge,del.	48.13	48.63	48.63	49.13
Bessemer,Pa. C3	46.00	....	46.50	47.00
Clairton,Rankin,So.Duquesne,Pa. C3	46.00	....	....	....
McKeesport,Pa. N3	46.00	....	....	47.00
Sharpsville,Pa. S6	46.00	46.50	46.50	47.00
Steelton,Pa. B2	48.00	48.50	49.00	49.50
Steubenville,O. W10	46.00	....	....	....
Struthers,O. S16	46.00	....	....	....
Swedeland,Pa. A3	48.00	48.50	49.00	49.50
Philadelphia,del.	49.44	49.94	50.44	50.94
Toledo,O. I-3	46.00	46.50	46.50	47.00
Cincinnati,del.	51.01	51.51	....	....
Troy,N.Y. R2	48.00	48.50	49.00	....
Youngstown District				
Hubbard,O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield,O.,del.	50.26	50.76	50.76	51.26

• Low phos, Southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorous: Deduct 38 cents per ton for P content of 0.70% and over

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; Add $1 for each 0.5% Si to 11.50%)

Jackson,O. J1, G2	$59.50
Buffalo H1	60.75

ELECTRIC FURNACE SIVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$71.50
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk,Iowa, OH & Fdry, 12½ lb, piglets, frt. allowed K2	82.00
Wenatchee,Wash. OH & Fdry, frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$60.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton,Pa. B2	54.00
Philadelphia delivered	57.09
Troy,N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices on Oct. 20, 1949; cents per pound unless otherwise noted. Price changes are indicated by italic type.
Code number following mill points indicate producing company; key on next two pages.

...OTS, Carbon, Forging (NT)

D...oit R7 .....$50.00
M...hall,Pa. C3 .....50.00

...OTS, Alloy (NT)

D...oit R7 .....$51.00
H...ston,Tex. S5 .....59.00
M...land,Pa. C18 .....51.00
M...hall,Pa. C3 .....51.00
S...Duquesne,Pa. C3 ...51.00

...ETS, BLOOMS & SLABS Carbon, Rerolling (NT)

B...semer,Pa. C3 .....$52.00
C...rton,Pa. C3 .....52.00
C...shohocken,Pa. A3 ..57.00
E...ley,Ala. T2 .....52.00
Fa...field,Ala. T2 .....52.00
Fo...tana,Calif. K1 ....71.00
G...y,Ind. C3 .....52.00
Jo...stown,Pa. B2 ....52.00
L...kawanna,N.Y. B2 ..52.00
M...hall,Pa. C3 .....52.00
Sh...ron,Pa. S3 .....52.00
S...hicago,Ill. C3 ....52.00
S...Duquesne,Pa. C3 ...52.00

...Carbon, Forging (NT)

B...semer,Pa. C3 .....$61.00
B...alo R2 .....61.00
C...ton,O. R2 .....61.00
C...rton,Pa. C3 .....61.00
C...eland R2 .....61.00
C...shohocken,Pa. A3 ..63.00
D...oit R7 .....61.00
E...ley,Ala. T2 .....61.00
Fa...field,Ala. T2 .....61.00
Fo...tana,Calif. K1 ....80.00
G...y,Ind. C3 .....61.00
G...eva,Utah G1 .....61.00
H...ston,Tex. S5 .....69.00
In...Harbor,Ind. I-2 ...61.00
Jo...stown,Pa. B2 ....61.00
L...kawanna,N.Y. B2 ..61.00
M...hall,Pa. C3 .....61.00
S...Duquesne,Pa. C3 ...61.00
S...hicago,Ill. C3, R2..61.00
W...ren,O. C17 .....61.00

Alloy (NT)

B...lehem,Pa. B2 ....$63.00
B...alo R2 .....63.00
C...ton,O. R2, T7 .....63.00
C...shohocken,Pa. A3 ..65.00
D...oit R7 .....63.00
Fo...tana,Calif. K1 ....82.00
G...y,Ind. C3 .....63.00
H...ston,Tex. S5 .....71.00
Jo...stown,Pa. B2 ....63.00
L...kawanna,N.Y. B2 ..63.00
M...sillon,O. R2 .....63.00
M...land,Pa. C18 .....63.00
M...hall,Pa. C3 .....63.00
Sh...ron,Pa. S3 .....63.00
S...hicago,Ill. C3, R2..63.00
S...Duquesne,Pa. C3 ...63.00
W...ren,O. C17 .....63.00

...ET BARS (NT)

...nsfield,O. E6 (GT)$58.00
P...tsmouth,O. P12 ....52.00
Sh...ron,Pa. S3 .....52.00

...UNDS, SEAMLESS TUBE (NT)

C...ton,O. R2 .....$76.00
C...eland R2 .....76.00
In...Harbor,Ind. I-2 ...76.00
M...sillon,O. R2 .....76.00
S...Chicago,Ill. R2 ....76.00

...ILP

A...iippa,Pa. J5 .....3.25
M...hall,Pa. C3 .....3.25
W...ren,O. R2 .....3.25
Youngstown C3, R2 ....3.25

...IRE RODS

A...bamaCity,Ala. R2 ..3.40
C...eland A7 .....3.40
D...ora,Pa. A7 .....3.40
Fa...field,Ala. T2 .....3.40
H...ston,Tex. S5 .....3.95
In...Harbor,Ind. Y1 ....3.40
Jo...stown,Pa. B2 ....3.40
Jo...et,Ill. A7 .....3.40
L...Angeles B3 .....4.20
M...nessen,Pa. P7 ....3.40
P...sburg,Calif. C11 ...4.05
P...tsmouth,O. P12 ....3.40
S...Chicago,Ill. R2 ....3.40
Sp...rrowsPoint B2 ....3.50
St...ling,Ill.(1) N15 ....3.40
Str...thers,O. Y1 .....3.40
Tr...rance,Calif. C11 ....4.20
Wo...rcester,Mass. A7 ...3.70

STRUCTURALS

Wide Flange

Bethlehem,Pa. B2 .....3.30
Lackawanna,N.Y. B2 ..3.30
Munhall,Pa. C3 .....3.20
So.Chicago,Ill. C3 .....3.20

H.-S. Low-Alloy

Aliquippa,Pa. J5 .....4.95
Bessemer,Ala. T2 .....4.95
Bethlehem,Pa.(14) B2 ..5.05
Clairton,Pa. C3 .....4.95
Fairfield,Ala. T2 .....4.95
Fontana,Calif. K1 .....6.10
Gary,Ind. C3 .....4.95
Ind.Harbor,Ind. I-2, Y1 .4.95
Johnstown,Pa. B2 .....5.05
Lackawna,N.Y.(14) B2 ..5.05
Munhall,Pa.(14) C3 ....4.95
So.Chicago,Ill.(14) C3 ..4.95
Struthers,O. Y1 .....4.95

Carbon Steel Stand. Shapes

Aliquippa,Pa. J5 .....3.25
Bessemer,Ala. T2 .....3.25
Bethlehem,Pa. B2 .....3.30
Clairton,Pa. C3 .....3.25
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....3.80
Gary,Ind. C3 .....3.25
Geneva,Utah G1 .....3.25
Houston,Tex. S5 .....3.65
Ind.Harbor,Ind. I-2 ...3.25
Johnstown,Pa. B2 .....3.30
KansasCity,Mo. S5 ....3.85
Lackawanna,N.Y. B2 ...3.30
LosAngeles B3 .....3.85
Minnequa,Colo. C10 ....3.75
Munhall,Pa. C3 .....3.25
Niles,Calif.(22) P1 ....3.97
Portland,Oreg. O4 .....3.90
Seattle B3 .....3.90
So.Chicago,Ill. C3, W14 .3.25
So.SanFrancisco B3 ....3.80
Torrance,Calif. C11 ....3.85
Weirton,W.Va. W6 .....3.25

Alloy Stand. Shapes

Clairton,Pa. C3 .....4.05
Fontana,Calif. K1 .....5.25
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 ....4.05

SHEET STEEL PILING

Ind.Harbor,Ind. I-2 .....4.05
Lackawanna,N.Y. B2 ....4.05
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 .....4.05
Weirton,W.Va. W6 .....4.05

PLATES Carbon Steel

AlabamaCity,Ala. R2 ...3.40
Aliquippa,Pa. J5 .....3.40
Ashland,Ky.(15) A10 ...3.40
Bessemer,Ala. T2 .....3.40
Clairton,Pa. C3 .....3.40
Claymont,Del. W16 ....3.50
Cleveland J5, R2 .....3.40
Coatesville,Pa. L7 .....3.50
Conshohocken,Pa. A3 ...3.50
Ecorse,Mich. G5 .....3.65
Fairfield,Ala. T2 .....3.40
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.40
Geneva,Utah G1 .....3.40
Harrisburg,Pa. C5 .....3.75
Houston,Tex. S5 .....3.80
Ind.Harbor,Ind. I-2, Y1 .3.40
Johnstown,Pa. B2 .....3.40
Lackawanna,N.Y. B2 ....3.40
Minnequa,Colo. C10 ....4.30
Munhall,Pa. C3 .....3.40
Pittsburgh J5 .....3.40
Seattle B3 .....4.30
Sharon,Pa. S3 .....3.40
So.Chicago,Ill. C3, W14 .3.40
SparrowsPoint,Md. B2 ..3.40
Steubenville,O. W10 ....3.40
Warren,O. R2 .....3.40
Weirton,W.Va. W6 .....3.40
Youngstown C3, Y1 ....3.40

PLATES (Universal Mill)

Fontana,Calif. K1 .....4.30

PLATES, Open-Hearth Alloy

Coatesville,Pa. L7 .....4.50
Conshohocken,Pa. A3 ...4.40
Fontana,Calif. K1 .....5.40
Gary,Ind. C3 .....4.40
Johnstown,Pa. B2 .....4.40
Munhall,Pa. C3 .....4.40
Sharon,Pa. S3 .....4.40
SparrowsPoint,Md. B2 ..4.40

PLATES, Ingot Iron

Ashland,cl(15) A10 ....3.65
Ashland,lcl(15) A10 ....4.15
Cleveland,cl R2 .....3.65
Warren,O.,cl R2 .....3.65

PLATES, Wrought Iron

Economy,Pa. B14 .....7.85

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....5.20
Bessemer,Ala. T2 .....5.20
Clairton,Pa. C3 .....5.20
Cleveland J5, R2 .....5.20
Conshohocken,Pa. A3 ...5.20
Ecorse,Mich. G5 .....5.45
Fairfield,Ala. T2 .....5.20
Fontana,Calif. K1 .....5.80
Gary,Ind. C3 .....5.20
Geneva,Utah G1 .....5.20
Houston,Tex. S5 .....5.60
Ind.Harbor,Ind. I-2, Y1 .5.20
Johnstown,Pa. B2 .....5.20
Munhall,Pa. C3 .....5.20
Pittsburgh J5 .....5.20
Sharon,Pa. S3 .....5.65
So.Chicago,Ill. C3 .....5.20
SparrowsPoint,Md. B2 ..5.20
Warren,O. R2 .....5.20
Youngstown Y1 .....5.20

FLOOR PLATES

Cleveland J5 .....4.55
Conshohocken,Pa. A3 ...4.55
Harrisburg,Pa. C5 .....4.55
Ind.Harbor,Ind. I-2 ....4.55
Munhall,Pa. C3 .....4.55
So.Chicago,Ill. C3 .....4.55

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2 ...3.35
Aliquippa,Pa. J5 .....3.35
Alton,Ill.(1) L1 .....3.35
Ashland,Ky.(17) A10 ..3.35
Atlanta,Ga. A11 .....3.50
Bessemer,Ala. T2 .....3.35
Buffalo R2 .....3.35
Canton,O. R2 .....3.35
Clairton,Pa. C3 .....3.35
Cleveland R2 .....3.35
Ecorse,Mich. G5 .....3.55
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I-2, Y1..3.35
Johnstown,Pa. B2 .....3.35
KansasCity,Mo. S5 ....3.95
Lackawanna,N.Y. B2 ...3.35
LosAngeles B3 .....4.05
Marion,O. P11 .....3.35
Midland,Pa. C18 .....3.35
Milton,Pa. B6 .....3.35
Minnequa,Colo. C10 ....3.85
Niles,Calif. P1 .....4.05
N.Tonawanda,N.Y. B11.3.35
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg. O4 .....4.10
Seattle B3, N14 .....4.10
S.Chicago C3, R2, W14..3.35
So.Duquesne,Pa. C3 ....3.35
S.SanFran.,Cal. B3 ....4.10
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Weirton,W.Va. W6 .....3.35
Youngstown C3, R2 ....3.35

BARS, Cold-Finished Carbon

Aliquippa,Pa. K5 .....4.00
Ambridge,Pa. W18 .....4.00
BeaverFalls, M12, R2...4.00
Buffalo B5 .....4.00
Camden,N.J. P13 .....4.48
Carnegie,Pa. C12 .....4.00
Chicago W18 .....4.00
Cleveland A7, C20 .....4.00
Cumberland,Md. C19 ...3.95
Donora,Pa. A7 .....4.00
Ecorse,Mich. G5 .....4.30
Elyria,O. W8 .....4.00
FranklinPark,Ill. N5 ....4.00
Gary,Ind. R2 .....4.00
Hammond,Ind. L2, M13..4.00
Hartford,Conn. R2 .....4.40
Harvey,Ill. B5 .....4.00
Indianapolis M13 .....4.20
LosAngeles R2 .....5.40
Mansfield,Mass B5 ....4.40
Massillon,O. R2, R8....4.00
Midland,Pa. C18 .....4.00
Monaca,Pa. S17 .....4.00
Newark,N.J. W18 .....4.40
Plymouth,Mich. P5 ....4.25
Pittsburgh J5 .....3.95
Putnam,Conn. W18 .....4.40
Readville,Mass. C14 ....4.40
St.Louis,Mo. M5 .....4.35
So.Chicago,Ill. W14 ....4.00
SpringCity,Pa.(5) K3 ...4.48
Struthers,O. Y1 .....4.00
Waukegan,Ill. A7 .....4.00
Youngstown F3, Y1 ....4.00

BAR SIZE ANGLES; S. SHAPES

Aliquippa,Pa. J5 .....3.35
Atlanta,Ga. A11 .....3.50
Bethlehem,Pa.(2) B2 ...3.55
Johnstown,Pa. B2 .....3.35
Lackawanna,N.Y. B2 ...3.35
Niles,Calif. P1 .....4.05
Pittsburgh(23) J5 .....3.35
Portland,Oreg. 04 .....4.10
SanFrancisco S7 .....4.05
Weirton,W.Va. W6 .....3.35

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. C3 .....4.00
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....4.00
Youngstown C3 .....4.00

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy

Aliquippa,Pa. J5 .....5.10
Bessemer,Ala. T2 .....5.10
Bethlehem,Pa. B2 .....5.10
Clairton,Pa. C3 .....5.10
Cleveland R2 .....5.10
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.10
Fontana,Calif. K1 .....6.15
Gary,Ind. C3 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ...5.10
Pittsburgh J5 .....5.10
So.Duquesne,Pa. C3 ....5.10
Struthers,O. Y1 .....5.10
Youngstown C3 .....5.10

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....3.75
Buffalo R2 .....3.75
Canton,O. R2, T7 .....3.75
Clairton,Pa. C3 .....3.75
Ecorse,Mich. G5 .....4.05
Fontana,Calif. K1 .....4.75
Gary,Ind. C3 .....3.75
Houston,Tex. S5 .....4.15
Ind.Harbor,Ind. I-2, Y1..3.75
Johnstown,Pa. B2 .....3.75
KansasCity,Mo. S5 ....4.35
Lackawanna,N.Y. B2 ...3.75
LosAngeles B3 .....4.80
Massillon,O. R2 .....3.75
Midland,Pa. C18 .....3.75
S.Chicago C3, R2, W14..3.75
So.Duquesne,Pa. C3 ....3.75
Struthers,O. Y1 .....3.75
Warren,O. C17 .....3.75
Youngstown C3 .....3.75

BARS, Cold-Finished Alloy

Aliquippa,Pa. K5 .....4.65
Ambridge,Pa. W18 .....4.65
BeaverFalls,Pa. M12 ....4.65
Bethlehem,Pa. B2 .....4.65
Buffalo B5 .....4.65
Canton,O. R2, T7 .....4.65
Carnegie,Pa. C12 .....4.65
Chicago W18 .....4.65
Cleveland A7, C20 .....4.65
Donora,Pa. A7 .....4.65
Elyria,O. W8 .....4.65
Gary,Ind. R2 .....4.65
Hammond,Ind. L2, M13..4.65
Hartford,Conn. R2 .....4.95
Harvey,Ill. B5 .....4.65
Indianapolis M13 .....4.85
Lackawanna,N.Y. B2 ...4.65
Mansfield,Mass. B5 ....4.95
Massillon,O. R2, R8....4.65
Midland,Pa. C18 .....4.65
Monaca,Pa. S17 .....4.65
Newark,N.J. W18 .....4.95
So.Chicago,Ill. R2, W14.4.65
Struthers,O. Y1 .....4.65
Waukegan,Ill. A7 .....4.65
Worcester,Mass. A7 ....4.95
Youngstown F3, Y1 ....4.65

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2 ...3.35
Alton,Ill.(6) L1 .....3.35
Atlanta,Ga. A11 .....3.50
Buffalo R2 .....3.35
Cleveland R2 .....3.35
Emeryville,Calif. J7 ....4.10
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.35
Houston,Tex. S5 .....3.75
Ind.Harbor,Ind. I-2, Y1..3.35
Johnstown,Pa. B2 .....3.35
KansasCity,Mo. S5 ....3.95
Lackawanna,N.Y. B2 ...3.35
LosAngeles B3 .....4.05
Minnequa,Colo. C10 ....4.25
Niles,Calif. P1 .....4.05
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Portland,Oreg. O4 .....4.10
Seattle,Wash. B3, N14..4.10
So.Chicago,Ill. R2 .....3.35
So.Duquesne,Pa. C3 ....3.35
So.SanFrancisco B3 ....4.10
SparrowsPoint,Md. B2 ..3.35
Struthers,O. Y1 .....3.35
Torrance,Calif. C11 ....4.05
Youngstown C3, R2 ....3.35

BARS, Reinforcing (Fabricated; to Consumers)

Huntington,W.Va. W7 ..4.50
Johnstown,¼-1" B2 ....4.25
LosAngeles B3 .....5.00
Marion,O. P11 .....4.25
Pittsburgh J5 .....4.25
Seattle B3, N14 .....5.00
So.SanFrancisco B3 ....5.00
SparrowsPt.,1⅛-1¼" B2..4.83
SparrowsPt.,¼-1" B2 ..4.25

RAIL STEEL BARS

ChicagoHts.,Ill.(3) I-2..3.25
FortWorth,Tex.(4) T4 ..4.33
Hntngtn,W.Va.(3,4) W7..3.35
Moline,Ill.(3) R2 .....3.35
Williamsport(2,3) S19 ..3.35
Williamsport(4) S19 ....3.85

BARS, Wrought Iron

Economy,Pa.(S.R.)B14..9.50
Economy,Pa.(D.R.)B14.11.00
Economy(Stablt) B14 ..11.30
McK.Rks.(S.R.) L5 ....8.60
McK.Rks.(D.R.) L5 ....11.25
McK.Rks.(Staybolt) L5.12.75

BARS, Hot-Rolled Ingot Iron

Ashland,Ky.(17) A10 ..3.60

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2 ..3.25
Ashland,Ky.(8) A10 ...3.25
Butler,Pa. A10 .....3.25
Cleveland J5, R2 .....3.25
Conshohocken,Pa. A3 ..3.35
Ecorse,Mich.(8) G5 ....3.45
Fairfield,Ala. T2 .....3.25
Fontana,Calif. K1 .....4.15
Gary,Ind. C3 .....3.25
Ind.Harbor,Ind. I-2, Y1..3.25
Irvin,Pa. C3 .....3.25
Kokomo,Ind. C16 .....3.35
Lackawanna,N.Y. B2 ....3.25
Munhall,Pa. C3 .....3.25
Pittsburg,Calif. C11 ....3.95
Pittsburgh J5 .....3.25
Sharon,Pa. S3 .....3.25
So.Chicago,Ill. W14 ....3.25
SparrowsPoint,Md. B2 ..3.25
Steubenville,O. W10 ....3.25
Torrance,Calif. C11 ....3.95
Warren,O. R2 .....3.25
Weirton,W.Va. W6 .....3.25
Youngstown C3, Y1 ....3.25

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)

AlabamaCity,Ala. R2 ...4.40
Dover,O. R1 .....5.00
Fairfield,Ala. T2 .....4.15
Ind.Harbor,Ind. I-2 ....4.15
Kokomo,Ind. C16 .....4.25
Mansfield,O. E6 .....4.15
Niles,O. N12, M4 .....4.15
Torrance,Calif. C11 ....5.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10 .....4.00
Cleveland J5 R2 .....4.00
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.00
Follansbee,W.Va. F4 ....4.00
Fontana,Calif. K1 .....4.90
Gary,Ind. C3 .....4.00
GraniteCity,Ill. G4 .....4.20
Ind.Harbor,Ind. I-2, Y1..4.00
Irvin,Pa. C3 .....4.00
Lackawanna,N.Y. B2 ....4.00
Middletown,O. A10 .....4.00
Pittsburg,Calif. C11 ....4.95
Pittsburgh J5 .....4.00
SparrowsPoint,Md. B2 ..4.00
Steubenville,O. W10 ....4.00
Warren,O. R2 .....4.00
Weirton,W.Va. W6 .....4.00
Youngstown Y1 .....4.00

SHEETS, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5, R2 .....6.05
Ecorse,Mich. G5 .....6.25
Fontana,Calif. K1 .....6.95
Gary,Ind. C3 .....6.05
Ind.Harbor,Ind. I-2, Y1..6.05
Irvin,Pa. C3 .....6.05
Lackawanna,N.Y. B2 ....6.05
Pittsburgh J5 .....6.05
Sharon,Pa. S3 .....6.05
SparrowsPoint,Md. B2 ..6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 .....6.05
Youngstown Y1 .....6.05

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy

Cleveland J5, R2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Calif. K1	6.64
Gary,Ind. C3	4.95
Ind.Harbor,Ind. I-2, Y1	4.95
Irvin,Pa. C3	4.95
Lackawanna,N.Y. B2	4.95
Pittsburgh J5	4.95
Sharon,Pa. S3	4.95
So.Chicago,Ill. C3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

SHEETS, Gal'zd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	5.40
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.40
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. C3	6.75
SparrowsPoint,Md. B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	4.95

SHEETS, Zincgrip No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2	5.15
Niles,O. R2	5.15
Weirton,W.Va. W6	5.00

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Culvert, No. 16 Flat

	Cu Alloy	Cu FE
Ashland A10	5.00	...
Canton,O. R2	5.05	5.50
Fairfield,Ala. T2	5.00	5.35
Gary C3	5.00	5.35
GraniteCity G4	5.40	5.70
Irvin C3	5.00	5.35
Kokomo C16	5.40	...
MartinsFy,O. W10	5.00	5.35
Pittsburg,Cal. C11	5.75	...
SparrowsPt. B2	5.00	...
Torrance,Cal. C11	5.75	...

SHEETS, Culvert, No. 16 Flat Ingot Iron

Ashland,Ky. A10	5.25

SHEETS, Well Casing

Torrance,Calif. C11	4.75
Youngstown C3	3.75

SHEETS, Aluminized

Butler,Pa. A10	7.75

SHEETS, Long Terne, Steel (No. 10; Commercial Quality)

BeechBotm.,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Weirton,W.Va. W6	4.80

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville, O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.75
Gary,Ind. C3	6.65
Ind.Harbor,Ind. I-2	6.65
Irvin,Pa. C3	6.65
Weirton,W.Va. W6	6.65
Yorkville,O. W10	6.65

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.20

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Yorkville,O. W10	8.10

SHEETS, Coated Ternes, 12 lb

Gary,Ind. C3	8.95
Yorkville,O. W10	8.95

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.50
Cleveland R2	3.85
Ind.Harbor,Ind. I-2	3.50
Warren,O. R2	3.85

SHEETS, Cold-Rolled Ingot Iron

Cleveland R-2	4.60
Middletown,O. A10	4.50
Warren,O. R2	4.60

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.95

SHEETS, Zincgrip No. 10 Flat, Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron, No. 12

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.40
Youngstown Y1	4.40

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.75
Fairfield,Ala. T2	5.85
Gary,Ind. C3	5.75
GraniteCity,Ill. G4	5.95
Ind.Harbor,Ind. I-2, Y1	5.75
Irvin,Pa. C3	5.75
Niles,O. R2	5.75
Pittsburg,Calif. C11	6.50
SparrowsPoint,Md. B2	5.85
Warren,O. R2	5.75
Weirton,W.Va. W6	5.75
Yorkville,O. W10	5.75

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.50	$7.75
Fairfield,Ala. T2	7.60	7.85
Gary C3	7.50	7.75
Gran.City,Ill. G4	7.70	7.95
Ind.Harb. I-2, Y1	7.50	7.75
Irvin,Pa. C3	7.50	7.75
Pitts.,Cal. C11	8.25	8.50
Sp.Pt.,Md. B2	7.60	7.85
Warren R2	7.50	7.75
Weirton W6	7.50	7.75
Yorkville,O. W10.	7.50	7.75

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.60

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.25
Cleveland J5	3.25
Detroit M1	3.45
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary, Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.25
N.Tonawanda,N.Y. B11	3.30
Pittsburg,Calif. C11	4.00
Pittsburgh J5	3.25
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.25
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.80
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Carbon

Berea,O. C7	6.10
Bridgeprt,Conn.(10) S15	4.00
Butler,Pa. A10	4.00
Chicago,Ill. T6	4.15
Cleveland A7, J5	4.00
Detroit D2, D3	4.25
Detroit M1	4.25
Dover,O. G6	4.00
Ecorse,Mich. G5	4.25
Follansbee,W.Va. F4	4.00
Fontana,Calif. K1	4.90
Ind.Harbor,Ind. I-2	4.00
Lackawanna,N.Y. B2	4.00
LosAngeles C1	5.00
Mattapan,Mass.(21) T6	4.45
Middletown,O. A10	4.00
NewBritain(10) S15	4.00
New Castle, Pa. B4, E5	4.00
NewHaven,Conn. A7, D2	4.45
NewKensington,Pa. A6	4.00
NewYork W3	5.00
Pawtucket,R.I.(11) N8	4.45
Pawtucket,R.I.(21) N8	4.45
Pawtucket,R.I. R3	4.45
Pittsburgh J5	4.00
Riverdale,Ill. A1	4.15
Sharon,Pa. S3	4.00
SparrowsPoint,Md. B2	4.00
Trenton,N.J.(13) R5	5.00
Wallingford,Conn. W2	4.45
Warren,O. R2, T5	4.00
Weirton,W.Va. W6	4.00
Youngstown C8, Y1	4.00

STRIP, Cold-Rolled, High-strength Low-Alloy

Cleveland A7, J5	6.00
Dover,O. G6	6.00
Ecorse,Mich. G5	6.25
Fontana,Calif. K1	6.90
Lackawanna,N.Y. B2	6.00
Pittsburgh J5	6.00
Sharon,Pa. S3	6.00
SparrowsPoint,Md. B2	6.00
Warren,O. R2	6.00
Weirton,W.Va. W6	6.00
Youngstown Y1	6.00

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.00
Youngstown C8	4.00

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.45	$6.70	$7.00
Fairfield,Ala. T2	6.55	6.80	7.10
Gary,Ill. C3	6.45	6.70	7.00
GraniteCity,Ill. G4	6.65	6.90	7.20
Ind.Harbor,Ind. I-2, Y1	6.45	6.70	7.00
Irvin,Pa. C3	6.45	6.70	7.00
Niles,O. R2	6.45	6.70	7.00
Pittsburg,Calif. C11	7.20	7.45	7.75
SparrowsPoint,Md. B2	6.55	6.80	7.10
Weirton,W.Va. W6	6.45	6.70	7.00
Yorkville,O. W10	6.45	6.70	7.00

SHEET SILICON (24 Gage Base)

	Field	Arm.	Elec.	Motor	Dyn.
BeechBottom,W.Va. W10	...	5.45	5.95	6.70	7.50
Brackenridge,Pa. A4	...	...	5.95	6.70	7.50
Follansbee,W.Va. F4	...	5.45	5.95	6.70	7.50
GraniteCity,Ill. G4	...	...	6.15	6.90	7.70
Ind.Harbor,Ind. I-2	5.15	5.45	5.95	...	...
Mansfield,O. E6	5.15	5.45	5.95	6.70	...
Niles,O. M4	5.15	5.45	5.95	...	...
Niles,O. N12	...	5.45	5.95	...	...
Toronto,O. F4	...	5.45	5.95	6.70	7.50
Vandergrift,Pa. C3	...	5.45	5.95	6.70	7.50
Warren,O. R2	...	5.45	5.95	6.70	...
Zanesville,O. A10	...	5.45	5.95	6.70	7.50

COILS AND CUT LENGTHS, Cold-Rolled, Silicon

	Field	Arm.	Elec.	Motor	Dyn.
Vandergrift,Pa. C3	...	5.70	6.20	6.95	7.75
Warren,O. R2	5.40	5.70	6.20	6.95	7.75

SHEETS, Silicon Transformer Grade

	72	65	58	52
BeechBottom,W.Va. W10	8.05	8.60	9.30	10.10
Brackenridge,Pa. A4	8.05	8.60	9.30	...
Follansbee,W.Va. F4	8.05	8.60	9.30	10.10
Toronto,O. F4	8.05	8.60	9.30	10.10
Vandergrift,Pa. C3	8.05	8.60	9.30	10.10
Zanesville,O. A10	8.05	8.60	9.30	10.10

COLD-REDUCED COILS and Cut Lengths, Silicon

	72	T-100	T-90	T-80
Butler,Pa. A10	...	12.35	13.60	14.85
Vandergrift,Pa. C3	8.30	11.35	12.60	13.85
Warren,O. R2	8.30	....	....	....

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.25-0.40C	0.40-0.60C	0.60-0.80C	0.80-1.05C	1.05-1.35C
Bridgeprt,Conn.(10) S15	4.00	5.50	6.10	8.05	10.30
Bristol,Conn. W1	...	...	6.40	8.35	....
Carnegie,Pa. S18	...	5.50	6.10	8.05	10.30
Chicago T6	4.25	5.65	6.25	8.20	10.50
Cleveland A7	4.00	5.50	6.10	8.05	10.30
Dover,O. G6	4.00	5.50	6.10	7.85	10.10
Harrison,N.J. C18	...	...	6.40	8.35	10.60
Mattapan,Mass. T6	4.50	5.80	6.40	8.35	10.60
NewBritn.,Conn.(10) S15	4.00	5.50	6.10	8.05	10.30
NewCastle,Pa. B4	4.00	5.50	6.10	...	...
NewYork W3	...	5.80	6.40	8.35	10.60
Pawtucket,R.I. N8					
Cleve.orPitts.Base	4.55	5.50	6.10	8.05	10.30
Worcester,Mass.Base	4.50	5.80	6.40	8.35	10.60
Sharon,Pa. S3	4.00	5.50	6.10	8.05	10.30
Trenton,N.J. R5	...	6.30	6.90	8.85	11.15
Union,N.J. H6	4.40	6.35	6.35	8.30	10.50
Wallingford,Conn. W2	4.50	5.80	6.40	8.05	10.30
Weirton,W.Va. W6	4.00	5.50	6.10	8.05	10.30
Worcester,Mass. A7	4.30	5.80	6.40	8.35	10.60
Worcester,Mass, T6	4.50	5.80	6.40	8.35	10.60
Youngstown C8	4.50	5.50	6.10	8.05	10.30

Key to Producing Companies

A1	Acme Steel Co.
A3	Alan Wood Steel Co.
A4	Allegheny Ludlum Steel
A6	American Shim Steel Co.
A7	American Steel & Wire
A8	Anchor Drawn Steel Co.
A9	Angell Nail & Chaplet
A10	Armco Steel Corp.
A11	Atlantic Steel Co.
B2	Bethlehem Steel Co.
B3	Beth. Pac. Coast Steel
B4	Blair Strip Steel Co.
B5	Bliss & Laughlin Inc.
B6	Bolardi Steel Corp.
B8	Braeburn Alloy Steel Co.
B11	Buffalo Bolt Co.
B14	A. M. Byers Co.
C1	Calif. Cold-Rolled Steel
C3	Carnegie-Illinois Steel
C4	Carpenter Steel Co
C5	Central Iron & Steel Div. Barium Steel Corp.
C7	Cleve. Cld. Roll. Mills Co.
C8	Cold Metal Products Co.
C9	Colonial Steel Co.
C10	Colorado Fuel & Iron
C11	Columbia Steel Co.
C12	Col. Steel & Shafting Co.
C13	Columbia Tool Steel Co.
C14	Compressed Steel Shaft.
C16	Continental Steel Corp.
C17	Copperweld Steel Co.
C18	Crucible Steel Co.
C19	Cumberland Steel Co.
C20	Cuyahoga Steel & Wire
D2	Detroit Steel Corp.
D3	Detroit Tube & Steel Co.
D4	Disston & Sons, Henry
E1	Eastrn. Gas&Fuel Assoc.
E2	Eastern Stainless Steel
E4	Electro Metallurgical Co.
E5	Elliott Bros. Steel Co.
E6	Empire Steel Co.
F2	Firth Sterling Steel
F3	Fitzsimons Steel Co.
F4	Follansbee Steel Corp.
F6	Fretz-Moon Tube Co.
G1	Geneva Steel Co.
G2	Globe Iron Co.
G4	Granite City Steel Co.
G5	Great Lakes Steel Corp.
G6	Greer Steel Co.
H1	Hanna Furnace Corp.
H4	Heppenstall Co.
H6	Hind Steel Co. Inc.
I-1	Igoe Bros. Inc.
I-2	Inland Steel Co.
I-3	Interlake Iron Corp.
J1	Jackson Iron & Steel Co.
J3	Jessop Steel Co.
J4	Johnson Steel & Wire Co.
J5	Jones & Laughlin Steel
J7	Judson Steel Corp.
K1	Kaiser Steel Corp.
K2	Keokuk Electro-Metals
K3	Keystone Drawn Steel
K4	Keystone Steel & Wire
K5	Kidd Drawn Steel Co.
L1	Laclede Steel Co.
L2	LaSalle Steel Co.
L3	Latrobe Electric Steel
L5	Lockhart Iron & Steel
L6	Lone Star Steel Co.

RIP, Hot-Rolled, High-Strength Low-Alloy

essemer,Ala. T2	4.95
leveland J5	4.95
orse,Mich. G5	5.15
airfield,Ala. T2	4.95
ontana,Cal. K1	6.64
ary,Ind. C3	4.95
d.Harb,Ind. I-2, Y1	4.95
ackawanna,N.Y. B2	4.95
ittsburgh J5	4.95
aron,Pa. S3	4.95
arrowsPoint,Md. B2	4.95
arren,O. R2	4.95
eirton,W.Va. W6	4.95
oungstown C3, Y1	4.95

GHT COOPERAGE HOOP

tlanta A11	3.60
iverdale,Ill. A1	3.60
aron,Pa. S3	3.60
oungstown C3	3.60

IRE, MB Spring, High-Carbon

liquippa,Pa. J5	5.55
lton,Ill(1) L1	5.55
artonville,Ill.(19) K4	5.55
uffalo W12	5.55
leveland A7	5.55
onora,Pa. A7	5.55
uluth A7	5.55
ostoria,O. S1	6.05
ohnstown,Pa. B2	5.55
osAngeles B3	6.50
onessen,Pa. P7	5.55
almer,Mass. W12	5.85
ittsburg,Calif. C11	6.50
ortsmouth,O. P12	5.55
.Chicago,Ill. R2	5.55
arrowsPoint,Md. B2	5.65
ruthers,O. Y1	5.55
renton,N.J. A7	5.85
renton,N.J. R5	6.35
aukegan,Ill. A7	5.55
orcester A7,J4,T6,W12	5.85

IRE, Cold-Rolled Flat

hicago T6	5.35
leveland A7	5.00
over,O. G6	5.00
ostoria,O. S1	5.50
okomo,Ind. C16	5.00
assillon,O. R8	5.00
onessen,Pa. P7	5.00
awtucket,R.I.(11) N8	5.55
awtucket,R.I.(12) N8	5.50
renton,N.J. R5	5.80
orcester,Mass. A7	5.30
orcester,Mass. T6	5.30

IRE, Fine and Weaving (8-in. Coils)

artonville,Ill.(19) K4	7.70
hicago W13	7.70
Cleveland A7	7.70
Fostoria,O. S1	7.70
Johnstown,Pa. B2	7.70
Kokomo,Ind. C16	7.70
Portsmouth,O. P12	7.70
Struthers,O. Y1	7.70
Trenton,N.J. R5	8.50
Waukegan,Ill. A7	7.70
Worcester,Mass. A7, T6	8.00

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.15
Aliquippa,Pa. J5	4.15
Alton,Ill.(1) L1	4.15
Bartonville,Ill.(1) K4	4.15
Buffalo W12	4.15
Chicago W13	4.15
Cleveland A7, C20	4.15
Crawfrdsvll,Ind. M8	4.30
Donora,Pa. A7	4.15
Duluth A7	4.15
Fairfield,Ala. T2	4.15
Fostoria,O.(24) S1	4.50
Houston S5	4.55
Johnstown,Pa. B2	4.15
Joliet,Ill. A7	4.15
KansasCity,Mo. S5	4.75
Kokomo,Ind. C16	4.25
LosAngeles B3	5.10
Millbury,Mass.(12) N6	4.45
Minnequa,Colo. C10	4.50
Monessen,Pa. P7	4.15
Newark,6-8ga. I-1	4.75
No.Tonawanda B11	4.18
Palmer,Mass. W12	4.45
Pittsburg,Calif. C11	5.10
Portsmouth,O. P12	4.15
Rankin,Pa. A7	4.15
So.Chicago,Ill. R2	4.15
So.SanFrancisco C10	5.10
SparrowsPoint,Md. B2	4.25
Sterling,Ill.(1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	5.10
Waukegan,Ill. A7	4.15
Worcester,Mass. A7,T6	4.45

WIRE (16 gage)	An'ld. Galv. Stone	An'ld. Galv. Stone
Aliquippa J5	9.05	10.55
Bartnvill(19) K4	9.05	10.55
Cleveland A7	9.05	10.55
Fostoria,O. S1	9.15	10.65
Johnstown B2	9.05	10.55
Kokomo C16	9.05	10.10
Minnequa C10	9.40	10.90
Pitts,Cal. C11	9.40	10.90
Prtsmth.(18) P12	9.05	10.55
SparrowsPt., B2	9.15	10.65
Struthers Y1	9.05	10.55
Waukegan A7	9.05	10.55

ROPE WIRE	Mild Plow	Plow	Imp. Plow
artonville,Ill. K4	7.10	7.40	7.80
leveland A7	7.50	7.80	8.20
onora,Pa. A7	7.50	7.80	8.20
ostoria,O. S1	8.00	8.30	8.70
ohnstown,Pa. B2	7.50	7.80	8.20
onessen,Pa. P7	7.50	7.80	8.20
ewHaven,Conn. A7	7.80	8.10	8.50
ortsmouth,O. P12	7.50	7.80	8.20
arrowsPoint,Md. B2	7.60	7.90	8.30
ruthers,O. Y1	7.50	7.80	8.20
renton,N.J. A7	7.80	8.10	8.50
renton,N.J. R5	8.00	8.30	8.70
aukegan,Ill. A7	7.50	7.80	8.20
illiamsport,Pa. B2	7.60	7.90	8.30
orcester,Mass. J4	7.50	7.80	8.20

WIRE, Merchant Quality (6 to 8 gage)

	An'ld.	Galv. Col.
Ala,City. R2	4.80	5.25
Aliquippa J5	4.80	5.25
Atlanta A11	*4.90*	*5.35*
Bartnville.(19) K4	4.80	5.25
Cleveland A7	4.80	5.25
Crawfrdvll. M8	4.95	5.40
Donora A7	4.80	5.25
Duluth A7	4.80	5.25
Fairfield T2	4.80	5.25
Houston,Tex. S5	5.20	5.65
Johnstown B2	4.80	5.25
Joliet,Ill. A7	4.80	5.25
KansasCity,Mo. S5	5.40	5.85
Kokomo C16	4.90	5.35
LosAngeles B3	5.75	...
Minnequa C10	5.15	5.60
Monessen P7	4.80	5.25
Pitts.Cal. C11	5.75	6.20
Portsmth.(18) P12	4.80	5.25
Rankin A7	4.80	5.25
So.Chicago R2	4.80	5.25
So.S.Fran. C10	5.75	6.20
SparrowsPt. B2	4.90	5.35
Sterling,Ill.(1) N15	4.80	5.25
Struthers,O. Y1	4.80	5.25
Torrance,Cal. C11	5.75	...
Worcester A7	5.10	5.55

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.20
Alton,Ill.(1) L1	5.20
Cleveland A7	5.20
Donora,Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
LosAngeles B3	6.15
NewHaven,Conn. A7	5.50
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
So.Chicago,Ill. R2	5.20
SparrowsPoint,Md. B2	5.30
Struthers,O. Y1	5.20
Torrance,Calif. C11	6.15
Trenton,N.J. A7	5.50
Waukegan,Ill. A7	5.20
Worcester,Mass. A7	5.50

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	123
Aliquippa,Pa. J5	123
Atlanta A11	125
Bartonville,Ill.(19) K4	123
Crawfordsville M8	126
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Houston,Tex. S5	131
Johnstown,Pa. B2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	130
Monessen,Pa. P7	123
Pittsburgh,Calif. C11	143
Portsmouth,O.(18) P12	123
Rankin,Pa. A7	123
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	143
SparrowsPoint,Md. B2	125
Sterling,Ill(1) N15	123

FENCE POSTS	Col.
Duluth A7	112
Huntington,W.Va. W7	112
Johnstown,Pa. B2	112
Joliet,Ill. A7	112
Minnequa,Colo. C10	120
Moline,Ill. R2	116
Williamspt,Pa., S19	n.t.$120

WOVEN FENCE, 9-15½ gage

	Col.
Ala.City,Ala.,17-18ga.	R2.175
AlabamaCity,Ala.	R2...109
Aliquip.,Pa.9-14½ga.	J5..109
Atlanta A11	111
Bartonville,Ill.(19) K4	109
Crawfordsvll,Ind. M8	112
Donora,Pa. A7	109
Duluth A7	109
Houston,Tex. S5	117
Fairfield,Ala. T2	109
Johnstown,Pa. B2	109
Johnstn,17ga.,6" B2	183
Johnstn,17ga.,4" B2	186
Joliet,Ill. A7	109
KansasCity,Mo. S5	121
Kokomo,Ind. C16	111
Minnequa,Colo. C10	116
Monessen,Pa. P7	109
Pittsburg,Calif. C11	132
Portsmouth,O.(18) P12	109
Rankin,Pa. A7	109
So.Chicago,Ill. R2	109
Sterling,Ill.(1) N15	109

BALE TIES, Single Loop	Col.
AlabamaCity, Ala. R2	106
Atlanta A11	107
Bartonville,Ill.(19) K4	106
Chicago W13	106
Crawfordsville M8	106
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Joliet,Ill. A7	106
Kokomo,Ind. C16	108
Minnequa, Colo. C10	113
Pittsburg,Calif. C11	130
Portsmouth,O.(18) P12	106
So.Chicago,Ill. R2	106
So.SanFran.,Calif. C10	130
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.20
Bartonville,Ill.(19) K4	5.20
Donora,Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
Joliet,Ill. A7	5.20
Kokomo,Ind. C16	5.30
Minnequa, Colo. C10	5.55
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
Rankin,Pa. A7	5.20
So.Chicago,Ill. R2	5.20
SparrowsPoint,Md. B2	5.30
Worcester,Mass. A7	5.50

NAILS & STAPLES, Stock (To Dealers & Mfrs.)

AlabamaCity,Ala. R2	103
Aliquippa,Pa. J5	103
Atlanta A11	105
Bartonville,Ill.(19) K4	103
Cleveland A9	110
Crawfordsville M8	106
Donora,Pa. A7	103
Duluth A7	103
Fairfield,Ala. T2	103
Houston,Tex. S5	111
Johnstown,Pa. B2	103
Joliet,Ill. A7	103
KansasCity,Mo. S5	115
Kokomo,Ind. C16	105
Minnequa, Colo. C10	110
Monessen,Pa. P7	103
Pittsburg,Calif. C11	122
Portsmouth,O. P12	103
Rankin,Pa. A7	103
So.Chicago,Ill. R2	103
SparrowsPoint,Md. B2	105
Sterling,Ill.(1) N15	103
Torrance,Calif. C11	123
Worcester,Mass. A7	109

NAILS & STAPLES, Stock (To Jobbers)

	Col.
Chicago,Ill. W13	103
Minnequa,Colo. C10	107
Portsmouth,O. P12	100

NAILS, Cut (100 lb keg)

Conshohoken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

AXLES

Fairfield,Ala. T2	5.20
Gary,Ind. C3	5.20
Ind.Harbor,Ind. S13	5.20
Johnstown,Pa. B2	5.20
McKeesRocks,Pa. C3	5.20

TIE PLATES

Fairfield,Ala. T2	4.05
Gary,Ind. C3	4.05
Ind.Harbor,Ind. I-2	4.05
Lackawanna,N.Y. B2	4.05
Minnequa,Colo. C10	4.05
Pittsburg,Calif. C11	4.20
Pittsburgh R2	4.05
Seattle B3	4.50
Steelton,Pa. B2	4.05
Torrance,Calif. C11	4.20
Weirton,W.Va. W6	4.05

JOINT BARS

Bessemer,Pa. C3	4.25
Fairfield,Ala. T2	4.25
Ind.Harbor,Ind. I-2	4.25
Joliet,Ill. C3	4.25
Lackawanna,N. Y. B2	4.25
Minnequa,Colo. C10	4.25
Steelton,Pa. B2	4.25

TRACK BOLTS	(20) Treated
Fairfield,Ala. T2	8.50
Lebanon,Pa. B2	8.50
Minnequa,Colo. C10	8.25
Pittsburgh,Pa. O3, P14	8.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.35
Ind.Harbor,Ind. I-2, Y1	5.35
Lebanon,Pa. B2	5.35
Minnequa, Colo. C10	5.35
Pittsburgh Y2	5.35
So.Chicago,Ill. R2	5.35
Struthers,O. Y1	5.35
Youngstown R2	5.35

LIGHT RAILS, Rail Steel

Huntington,W.Va. W7	3.55
Williamsport,Pa. S19	3.55

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb. Under
Bessemer,Pa. C3	3.20	3.10	3.15	3.55
Ensley,Ala. T2	3.20	3.10	3.15	3.55
Fairfield,Ala. T2	...	...	...	3.55
Gary,Ind. C3	3.20	3.10	3.15	...
Ind.Harbor,Ind. I-2	3.20	3.10	3.15	...
Johnstown,Pa. B2	...	...	...	(16)3.55
Lackawanna B2	3.20	3.10	...	3.55
Minnequa.Colo. C10	3.20	3.10	...	4.25
Steelton,Pa. B2	3.20	3.10	...	...

Key to Producing Companies

7 Lukens Steel Co.

1 McLouth Steel Corp.
4 Mahoning Valley Steel
5 Medart Co.
6 Mercer Tube & Mfg. Co.
8 Mid-States Steel & Wire
9 Midvale Co.
10 Missouri-Illinois Furnace
12 Moltrup Steel Products
13 Monarch Steel Co.

2 National Supply Co.
3 National Tube Co.
5 Nelsen Steel & Wire Co.
8 New Eng.High Carb.Wire
8 Newman-Crosby Steel
12 Niles Rolling Mill Co.
14 Nrthwst. Steel Roll. Mills
15 Northwestern S.&W. Co.
16 New Delphos Mfg. Co.

3 Oliver Iron & Steel Corp.
4 Oregon Steel Mills

1 Pacific States Steel Corp.
5 Pilgrim Drawn Steel Crp.
6 Pittsburgh Coke & Chem.
7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San. Corp.

U4 Universal Cyclops Steel

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Wstrn.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Co.
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.

Y1 Youngstwn. Sheet & Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	19.00	18W,4Cr,3V	114.50
Extra Carbon	22.00	18W,4Cr,2V,9Co	168.50
Spec. Carbon	26.50	18W,4Cr,2V,6Co	154.00
Oil Hardening	29.00	18.25W,4.25Cr,1V,4.75Co	142.00
Hi.-Carbon-Cr	52.00	20.25W,4.25Cr,1.6V,12.25Co	266.50
Cr Hot Wrk	29.00	1.5W,4Cr,1V,8.5Mo	65.00
18W,4Cr,1V	90.50	6.4W,4.5Cr,1.9V,5Mo	69.50
18W,4Cr,2V	102.50	6W,4Cr,3V,6Mo	88.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, R2, S8, T7, U4, V2, V3.

(1) Chicago Base. (2) Angles.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. Base.
(8) 16 gage and heavier.
(9) 6" and narrower.
(10) Pittsburgh Base.
(11) Cleveland & Pittsburgh Base.
(12) Worcester, Mass. Base.
(13) 3" & wider; over ½" to under 3" 5.50c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh Base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. Base.
(22) Del. San Fran. Bay area.
(23) Angles 1"x1" to 1¼"x1¼" only.
(24) Deduct 0.35c for finer than 15 Ga.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	41.5	39.5	38.5	13.5	11.5	10.5
¼	6.0	0.42	39.5	37.5	36.5	15.5	13.5	12.5
⅜	6.0	0.57	36	34	33	12.5	10.5	9.5
½	8.5	0.85	43	41	42	26.5	24.5	25.5
¾	11.5	1.13	46	44	45	30.5	28.5	29.5
1	17.0	1.68	48.5	46.5	47.5	33.5	31.5	32.5
1¼	23.0	2.28	49	47	48	34	32	33
1½	27.5	2.73	49.5	47.5	48.5	34.5	32.5	33.5
2	37.0	3.68	50	48	49	35	33	34
2½	58.5	5.82	50.5	48.5	49.5	35.5	33.5	34.5
3	76.5	7.62	50.5	48.5	49.5	35.5	33.5	34.5

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va. 1½ percentage point lower on ⅛", 2 points lower on ¼", 3 points lower ⅜", W10; Wheatland, Pa., 2 points lower on ⅛ through ⅜", W9. Following make ½ through 3" only: Lorain, O. N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

Columns B & E: Sparrows Point, Md. B2; Wheatland, Pa., ⅛ through ⅜", W9.

Columns C & F: Alton, Ill. (Lorain, O. Base) LI; Indiana Harbor, Ind., ½ through 3", Y1.

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa., ⅛ through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜" W10; Wheatland, Pa., except 2 pts lower on ⅛ through ⅜" W9. Following make ½ through 3" only; Lorain N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	38.5	23	38.5	23
2½	58.5	5.82	41.5	26	41.5	26
3	76.5	7.62	41.5	26	41.5	26
3½	92.0	9.20	43.5	28	43.5	28
4	$1.09	10.89	43.5	28	43.5	28
5	1.48	14.81	43.5	28	43.5	28
6	1.92	19.18	43.5	28	43.5	28

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 4 to 24 in., inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	11.50	13.39	13.00	13.00
1¼	13	13.62	15.87	13.21	15.39
1½	13	15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2¼	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pacific Tube Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

BOLTS, NUTS

(To consumers)

F.o.b. midwestern plants. Additional discounts on carriage, machine bolts, 5 for cl; 15 for full containers, except tire and plow bolts.

CARRIAGE, MACHINE BOLTS

(Per cent off list)

½-in., smaller; up to 6 in. long 35
⅝ & ⅝ x 6 in., shorter. 37
¾-in. & larger x 6 in., shorter 34
All diameters longer than 6-in. 30
Tire bolts 25
Plow bolts 47
Lag bolts, 6 in., shorter 37
Lag bolts, longer than 6 in. 35

NUTS

Semifinished hexagon	A.S. Reg. & Light	Heavy
⅞-in., smaller	41 off	....
½-in., smaller	....	38 off
½-in.-1-in.	....39 off	....
⅝-in.-1-in.	....	37 off
1⅛-in.-1½-in.	.37 off	35 off
1⅝-in., larger	..34 off	28 off

Additional discount of 15 for full containers.

STOVE BOLTS

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

SQUARE HEAD SET SCREWS

Upset 1-in. & smaller..51 off
¾, ⅞, & 1 x 6-in. & shorter .....35 off
Headless, ¼-in., larger..31 off

HEXAGON CAP SCREWS

(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright) ..... 46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter ..... 40 off

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 6.75c
⅞-in., under .....48 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....Net to $1 off

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	37.50	30.50	28.50
302...	37.50	33.00	28.50
303...	39.50	36.50	31.00
304...	39.50	35.00	30.00
309...	52.00	52.00	41.50
316...	53.00	55.00	46.00
321...	45.50	44.50	34.00
347...	50.00	48.50	38.50
410...	33.00	27.00	23.00
416...	33.50	33.50	23.50
420...	40.50	43.50	28.50
430...	35.50	27.50	23.50
501...	24.00	22.50	11.50
502...	25.00	23.50	12.50

Baltimore, Types 301 through 347 sheets, except 309 E2
Baltimore, bars, wire and structurals A10
Brackenridge, Pa., sheets A4
Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4
Butler, Pa., sheets and strip except Types 309, 501 & 502 A10
Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18
Cleveland, strip, except Type 309 quoted 51.00c, and except Type 416 A7
Detroit, strip, except Type 309 quoted 51.00c M1
Dunkirk, N.Y., bars, wire A4
Duquesne, Pa., bars C3
Gary, Ind., sheets except Type 416 C3
Harrison, N. J., strip C18
Massillon, all products, except Type 309 bars, wire & structurals quoted 42.00c, Type 501 10.50c, Type 502 11.50c R2
McKeesport, Pa., bars; sheets except Type 416, C3
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2
Middletown, O., sheets and strip, except Types 501 and 502 and except 309 strip quoted 51.00c A10
Midland, sheets & strip C18
Munhall, Pa., bars C3
Pittsburgh, sheets C18
Reading, Pa., bars & strip except Type 309 bars quoted 42.00c C4
So. Chicago, Ind., bars & structurals C3
Syracuse, N. Y., bars, wire & structurals C18
Titusville, Pa., bars U4
Wallingford, Conn., strip W2
Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3
Washington, Pa., Types 301 through 347 sheets & strip except 303 & 309; 316 sheets 58.00c strip 60.00c W4
Watervliet, N. Y., structurals & bars A4
Waukegan, bars & wire A7
West Leechburg, Pa., strip, except Type 309 quoted 51.00c A4
Youngstown, strip C8.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Diam.	Inches— Length	Cents per lb.
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4,5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00
	CARBON	
40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	84,90	7.50
14	60,72	8.00
10,12	60	8.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Imported, net ton, duty paid, metallurgical grade, $39-$40.

REFRACTORIES

(Prices per 1000 brick, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hardfired, $135 at above points.

High-heat Duty: Salina, Pa. $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Oriviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

LADLE BRICK

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W.Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅝" grains; Bulk, $30.50-$31.00; single paper bags, $35.00-$35.50.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 20.00
Toluol, one deg...19.00-23.50
Industrial xylol ..20.50-26.50
Per ton bulk, ovens
Sulphate of ammonia $45.00
Per pound, ovens
Phenol, 40 (carlots, returnable drums) 13.25
Do., less than carlots..14.00
Do., tank cars 12.50

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural) lower lake ports. Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.30
Mesabi nonbessemer	7.25
High phosphorus	7.25

EASTERN LOCAL ORE

Cents, unit, del. E. Pa. Foundry and basic 56.62% concentrates, contract .16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%: Spot:	17.00
Long-term contract	15.00
Brazil iron ore, 68-69%	19.50

TUNGSTEN ORE

Wolframite, scheelite, net ton unit, duty pd.. $20-$22

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. U.S. ports; prices on lower grades adjusted to Mn content and impurities.

CHROME ORE

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg. or Tacoma, Wash.

Indian and African	
48% 2.8:1	$35.00
48% 3:1	37.50
48% no ratio	28.50-29.00
South African Transvaal	
44% no ratio	$19.00-20.00
45% no ratio	19.50-21.00
48% no ratio	27.00-28.00
50% no ratio	28.50-29.00
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	28.00-29.00
48% 3:1 lump	37.50
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide conc., lb, Mo, cont. Mines $0.90

METALLURGICAL COKE

Price per Net Ton

BEEHIVE OVENS

Connellsvil, fur.	$13.00-13.50
Connellsvil, fdry.	15.50-16.00
New River, foundry	18.00
Wise county, foundry	15.35
Wise county, furnace	14.60

OVEN FOUNDRY COKE

Kearny, N. J., ovens	$22.00
Everett, Mass., ovens	
New England, del.‡	22.70
Chicago, ovens	20.00
Chicago, del.	†21.45
Detroit, del.	23.91
Terre Haute, ovens	20.20
Milwaukee, ovens	20.75
Indianapolis, ovens	19.85
Chicago, del.	23.32
Cincinnati, del.	22.77
Detroit, del.	23.75
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.02
Cleveland, del.	22.62
Erie, del.	21.04
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens	20.40
Portsmouth, O., ovens	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.95
Flint, del.	23.00
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡Or within $4.03 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.60	6.51	7.10	5.82	...	5.77	6.31	8.28	5.53	5.85	7.36
New York(c'try)	5.40	6.31	6.90	5.62	...	5.57	6.11	8.08	5.33	5.65	7.16
Boston (city) ..	5.75	6.75**	7.16	5.80	...	5.72	6.22	8.77	5.62	5.95	7.45
Boston (c'try) .	5.55	6.55**	6.96	5.60	...	5.52	6.02	8.57	5.42	5.75	7.25
Phila. (city)...	5.90	6.49	6.88	5.65	...	5.65	6.21	8.10	5.35	5.60	6.80
Phila. (c'try) ..	5.65	6.24	6.63	5.40	...	5.40	5.96	7.85	5.10	5.35	6.55
Balt. (city)....	5.46	6.36	6.81	5.52	...	5.57	6.05	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.66	5.37	...	5.42	5.91	....	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)..	4.85	5.75[4]*	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse).	5.32	6.22[4]*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.70	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse) .	4.85	5.75	6.55	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.27‡	5.94**	6.83	5.39	6.10	5.44	5.95	...	5.44	5.64	7.05
Chicago (city) .	5.05	5.95[4]	7.05	5.05	6.35-6.85	5.10	5.60	7.90[5]	5.10	5.30	6.75
Chicago (w'hse)	4.85	5.75[4]	6.85	4.85	6.15-6.65	4.90	5.40	7.70[5]	4.90	5.10	6.55
Milwaukee (city)	5.18	6.08[4]	7.18	5.18	6.48-6.98	5.23	5.78	8.03[5]	5.23	5.43	6.88
Milwau. (c'try).	5.03	5.93[4]	7.03	5.03	6.33-6.83	5.08	5.63	7.88[5]	5.08	5.28	6.73
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse) .	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham(c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	5.60	7.15	7.60	6.10	7.75	5.75	7.40	...	5.60	5.65	7.90
L. A. (w'hse)..	5.45	7.00	7.45	5.95	7.60	5.60	7.25	...	5.45	5.50	7.75
San Francisco..	6.15[10]	7.50[3]	7.80	6.75[10]	8.25[8]	5.90[10]	7.55	10.85[3]	5.90	6.35	8.10
Seattle-Tacoma.	6.70[7]‡	8.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.10	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); § as rolled; ** 17 gage; †† as annealed. Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

LEADING FERROALLOY PRODUCTS

Manganese Alloys

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 7.5% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

Chromium Alloys

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload. 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.00c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l., lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

(Please turn to page 124)

Secondary Metal Prices Rise

Remelt aluminum ingot, aluminum and red metal scrap prices advance fractionally. Spot tin eases ⅛-cent to 95.75c and lead stablizes at 12.80-cent level

New York—Strength in secondary metals featured trading in nonferrous metal markets last week. Some remelt aluminum ingot producers advanced prices ¼-cent to ½-cent a pound, due to increased cost of scrap. Leading brass ingot makers held prices unchanged, although they also are paying more for their scrap.

As a result of the shrinkage in steel supplies, some metalworking plants are substituting aluminum for steel and this practice will broaden so long as the flow of steel is curtailed. Strength in the secondary copper market is supported indirectly by active demand for electrolytic copper which has imparted a firm price tone to that market.

The trend in these markets is running counter to that in lead, which has eased to 12.80c, St. Louis, and in tin which has eased to 95.75c, New York, for spot Straits. The latter market and zinc will remain dull until their largest outlet, the steel industry, resumes normal operations.

Aluminum—Strike in the basic industry and at nine plants of Aluminum Co. of America has resulted in a sharp increase in pressure for deliveries of aluminum products. Warehouse interests expect their stocks of aluminum sheets to be reduced sharply by Nov. 1, while mill backlogs for aluminum sheets and tubing are extended nearly two months; structural beams and channels about five to six weeks. Full effect of the steel strike on demand for aluminum products, however, is expected to reach its peak over the next two weeks as steel inventories become depleted.

Secondary Aluminum—Price spread being quoted on grades of remelt aluminum ingot has been widened to as much as ¾-cent a pound by the latest ¼ to ½-cent upward price revisions. Piston alloys are now quoted 16.25c to 17.00c and No. 12 foundry alloy, No. 2 grade, 15.50c to 16.25c. Although buying of deoxidizing grades is negligible due to the closedown of most steel mills, prices on these grades have also moved higher on the basis of increased scrap costs.

Copper—Users of copper continue to press for November coverage. Producers' books are filled for October, indicating that deliveries this month will exceed 104,000 tons compared with 103,115 tons in September and 113,154 tons in March, the high for the year to date. In addition to these deliveries to consumers, substantial tonnages are being taken by the government for stockpiling.

Demand for copper is coming from all classifications of consuming interests, including brass mills, wire mills and home appliance makers. Consumption is now running ahead of domestic mine and custom smelter supply, plus imports of about 30,000 tons monthly.

The 17.62½-cent price for electrolytic is described as strong. Some market observers believe that under normal conditions the price might have risen under pressure of the present buying movement. The steel strike is exerting a restraining influence, since copper consumers are unable to forecast with any degree of certainty what the ultimate effect will be on the general economy.

Refiners' scrap prices are higher at 13.75c to 14.00c for No. 1 copper, 12.75c to 13.00c for No. 2 copper, 11.75c to 12.00c for light copper and 12.00c for refinery brass. Ingot makers' bids also are higher at 14.00c to 14.25c for No. 1 copper, 13.00c for No. 2 copper, 12.00c for light copper, 11.25c to 11.50c for No. 1 composition red brass, and 8.75c to 9.00c for heavy yellow brass. The advance in scrap prices was necessary to stimulate the flow of material which has been sluggish this month.

Lead—A fair amount of business is being booked in the lead market at 12.80c, St. Louis. The latest reduction, amounting to ¾-cent and having been initiated by a custom melter on Oct. 14, was the sharpest in the present downward movement and brought the market within 1-cent of the year's low. Consumers are hesitant in making fresh commitments, fearing a further reduction in prices. However, custom smelters have announced that they believe the market will stabilize at the current level and that they will give the market opportunity to do so.

Zinc—A few galvanizing firms continued to place orders last week for prime western zinc at 9.25c, East St. Louis, but most of them show no interest in making new contracts while their plants are strike-bound. A tight supply situation is developing in special high grade zinc which commands a premium of 1-cent to 1¼-cents over prime western. This grade is used by brass mills and die casters and these consumers are showing increased buying interest. The tight supply situation stems from a strike at the New Jersey Zinc Co.'s smelter in New Jersey and sharply reduced operations of the Bunker Hill & Sullivan smelter in Idaho.

Due to the latest reduction in the price of lead, a leading manufacturer of zinc oxides has announced a further cut of ⅜-cent a pound in prices on leaded oxides, effective as of Oct. 17. The new carload price for the 35 per cent leaded grade is 12.00c per pound; for the 50 per cent leaded grade, 12.50c. Less carload lots are priced at the usual ¼-cent premium.

Tin—Moderate tonnages of Grade A tin are being sold on the basis of 95.75c for prompt delivery, a decline of ⅛-cent. Prices range downward to 95.00c for delivery in early November. Grade A tin for November arrival is offered at 94.87½c; for December arrival, at 94.00c by interests not selling against offerings originating with the British Ministry of Supply or the Dutch and Belgian producers. Some market interests believe that Reconstruction Finance Corp. will reduce its selling price to 95.00c, the level established by the British Ministry of Supply. This would establish a new basis for settlement on Bolivian concentrates received in October.

Production of tin at the Longhorn smelter in Texas City, Tex., amounted to 27,304 tons for the first nine months of this year. During the full year of 1948, 36,677 tons were produced compared with 33,677 tons in 1947 and 43,468 tons in 1946, the record high.

Aluminum Production Gains

Washington—Domestic production of aluminum increased to 55,777 net tons in July from 54,184 tons in June and compared with 52,937 tons in July, 1948, reports Bureau of Mines. Output continued to exceed shipments, which rose to 50,075 tons in July from 30,711 in June, so that inventories of pig aluminum at reduction plants reached 53,809 tons, or about the equivalent of one month's production. Stocks totaled 48,10 tons at the end of June and 11,74 tons at the end of April, the low for the year to date.

For the first time this year, exports of crude and semicrude aluminum in July nearly equaled imports. Receipts of crude from Canada, which constituted nearly all of the imports, declined about 36 per cent from June, and shipments of semicrude from United Kingdom were also greatly reduced. July exports of ingots, slabs and crude increased to 2334 tons while those of plate, sheets, bars, etc. amounted to 230 tons.

Production of aluminum ingot at secondary smelters in May, the latest month for which figures are available, dropped to 7584 tons. Consumption of aluminum-base scrap for this record low-level output declined 8 per cent to 8697 tons.

Canadian Lead Price Declines

Montreal—Consolidated Mining & Smelting Co. of Canada reduced its lead price ¾-cent a pound on Oct. 17 to 14.25c. This action was taken following a like drop in the New York market on Oct. 14 to the basis of 13.00c, New York. The price of lead here has declined four times since Sept. 20 when it was established at 16.50c following devaluation.

Bauxite Production Increases

Washington—Domestic mine output of bauxite in the second quarter of 1949 is estimated by the Bureau of Mines at 332,553 long tons (dried equivalent.) Although final figures are not available for certain strike-bound operations in Arkansas, preliminary data indicates a gain of about 5 per cent over the 317,738 tons produced in the first three months. Over 96 per cent of the second quarter total was mined in Arkansas; as production for other states taken together reached the lowest level in two years.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

rimary Metals

pper: Electrolytic 17.62½c, Conn. Valley, ke, 17.75c, Conn. Valley.

ass Ingot: 85-5-5-5 (No. 115) 15.50-16.50c; -10-2 (No. 215) 24.50c; 80-10-10 (No. 305) 00c; No. 1 yellow (No. 405) 13.25-14.25c.

ıc: Prime western 9.25c, brass special 0c, intermediate 9.75c, East St. Louis; h grade 10.25c, delivered.

ad: Common 12.80c; chemical 12.90c; cor- ling 12.90c, St. Louis.

imary Aluminum: 99% plus, ingots 17.00c, s 16.00c. Base prices for 10,000 lb and er, f.o.b. shipping point.

condary Aluminum: Piston alloys 16.25- 00c; No. 12 foundry alloy (No. 2 grade) 50-16.25c; steel deoxidizing grades, notch rs, granulated or shot: Grade 1, 17.50-17.75c; ade 2, 16.50-16.75c; grade 3, 15.50-15.75c; ade 4, 14.75-15.25c. Prices include freight carload rate up to 75 cents per 100 lb.

titanium-aluminum alloy No. 1 (low Cu) 00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddy- ne, Pa.

gnesium: Commercially pure (99.8%) stand- 1 ingots, 10,000 lb and over, 20.50c, f.o.b. eeport, Tex.

n: Straits and other Grade A tin, spot, .75c, New York; Straits, October, 95.00- .50c; Straits, November, 95.00c. Chinese, % tin, October, 87.00-88.00c. RFC selling ices for prompt delivery, ex-dock New York f.o.b. Texas City, Tex.: Grade A, 99.8% higher (including Straits) 96.00c; Grade B, .8% or higher, not meeting specs. for Grade with 0.05% max. arsenic, 95.80c; Grade C, .65-99.79%, incl., 95.40c; Grade D, 99.5- .649%, 95.40c; Grade E, 99-99.499%, 95.00c; ade F, 98-98.999%, 94.50c; Grade G, 95- 999%, 92.00c. Prices for Grade D through ade G are for tin content.

timony: American 99-99.8% and over but t meeting specifications below, 32.00c; 99.8% d over (arsenic 0.05% max.; other impuri- s, 0.1% max.) 32.50c; f.o.b. Laredo, Tex., r bulk shipments. Foreign, 99% (Chinese, nglish, Belgium), prompt, 26.25c, New York.

ckel: Electrolytic cathodes, 99.9%, base sizes refinery, unpacked, 40.00c; 25-lb pigs, .50c; "XX" nickel shot, 43.50c; "F" nickel ot or ingots, for addition to cast iron, .50c. Prices include import duty.

ercury: Open market, spot, New York $73- 5 per 76-lb flask.

ryllium-Copper: 3.75-4.25% Be, $24.50 per contained Be.

dmium: "Regular" straight or flat forms, del.; special or patented shapes, $2.15.

balt: 97-98%, $1.80 per lb for 550 lb (keg); .82 per lb for 100 lb (case); $1.87 per lb der 100 lb.

ld: U. S. Treasury, $35 per ounce.

lver: Open market, New York, 73.25c per nce.

atinum: $69-72 per ounce.

alladium: $24 per troy ounce.

dium: $100-$110 per troy ounce.

tanium (sponge form): $5 per pound.

olled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

heet: Copper 31.30; yellow brass 28.19; com- ercial bronze, 95%, 31.28; 90%, 30.84; red rass, 85%, 29.89; 80%, 29.47; best quality, 1.01; nickel silver, 18%, 41.78; phosphor- onze, grade A, 5%, 50.47.

ods: Copper, hot-rolled 27.15; cold-drawn 3.40; yellow brass free cutting, 22.76; com- ercial bronze, 95% 30.97; 90% 30.53; red rass 85% 29.58; 80% 29.16.

amless Tubing: Copper 31.34, yellow brass 1.20; commercial bronze 90% 33.50; red rass 85% 32.80; 80% 32.38.

ire: Yellow brass 28.48; commercial bronze, 5% 31.57; 90% 31.13; red brass, 85% 30.18; 0% 29.76; best quality brass 29.30.

opper Wire: Bare soft, f.o.b., eastern mills, 0,000 lb lots 22.42½, l.c.l. 23.05, c.l. 22.55; eatherproof, f.o.b. eastern mills, 100,000 lb ts 24.693, l.c.l. 25.443, c.l. 24.943; magnet, elivered, c.l. 27.62½, 15,000 lb or more 7.87½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter. 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $18.00 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $18.00 per cwt. Traps and bends: List price plus 48%.

ZINC

Sheets, 15.50c f.o.b. mill, 36,000 lb and over Ribbon zinc in coils, 15.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.00c; over 12-in., 15.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 27.96c; oval 27.46c; cast 25.99c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.25c; over 250 lb, 24.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 2090 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb. 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyandie: 100-lb drums 40.50c, f.o.b. Cleveland; 39.25c, Detroit; 39.25c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 88.00c; 100 lb kegs, 89.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	12.00	11.75	11.00
Commercial Bronze			
95%	13.62½	13.37½	12.87½
90%	13.50	13.25	12.75
Red brass			
85%	13.25	13.00	13.12½
80%	13.00	12.75	12.25
Best Quality (71-80%)	12.87½	12.62½	12.12½
Muntz Metal	11.12½	10.87½	10.37½
Nickel, silver, 10%	14.00	13.75	7.00
Phos. bronze, A	16.37½	16.12½	15.12½
Naval brass	11.62½	11.37½	10.87½
Manganese bronze	11.62½	11.37½	10.75

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.00-14.25; No. 2 copper 13.00; light copper 12.00; composition red brass 11.25-11.50; radiators 9.25-9.50; heavy yellow brass 8.75-9.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 13.75-14.00; No. 2 copper 12.75-13.00; light copper 11.75-12.00; refinery brass (60% copper) per dry copper content 12.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.00-12.50; No. 2 11.00-11.25; light copper 10.00-10.25; No. 1 composition red brass 9.00-9.25, No. 1 composition turnings 8.50-8.75, mixed brass turnings 5.50-5.75; new brass clippings 10.00-10.50; No. 1 brass rod turnings 7.75-8.00; light brass 5.50-5.75; heavy yellow brass 6.00-6.25; new brass rod ends 7.75-8.00; auto radiators, unsweated 7.25-7.50; coks and faucets, 7.25-7.50; brass pipe 8.00-8.25.

Lead: Heavy 9.50-9.75, battery plates 4.50-4.75; linotype and stereotype 10.00-10.25; electrotype 9.00-9.25; mixed babbitt 9.75-10.00.

Zinc: Old zinc 3.50-4.00, new die cast scrap 3.25-3.75, old die cast scrap 2.50.

Tin: No. 1 pewter 48.00-50.00, block tin pipe 70.00-72.00, No. 1 babbitt 36.00-38.00.

Aluminum: Clippings 2S 10.00-10.50, old sheets 7.00-7.50, crankcase 7.00-7.50, borings and turnings 3.00-3.50.

DAILY PRICE RECORD

1949	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
ct. 18-20	17.625	12.80	9.25	95.750	17.00	32.00	40.00	73.25
ct. 17	17.625	12.80	9.25	95.875	17.00	32.00	40.00	73.25
ct. 14-15	17.625	12.85	9.25	95.875	17.00	32.00	40.00	73.25
ct. 10-13	17.625	13.55	9.25	95.875	17.00	32.00	40.00	73.25
ct. 7-8	17.625	13.60	9.25	95.875	17.00	32.00	40.00	73.25
ct. 4-6	17.625	14.05	9.25	96.00	17.00	38.50	40.00	73.25
ct. 3	17.625	14.10	9.25	96.00	17.00	38.50	40.00	73.25
ct. 1	17.625	14.55	10.00	96.00	17.00	38.50	40.00	73.25
ept. Avg.	17.625	14.853	10.058	101.654	17.00	38.500	40.000	73.202

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del, New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

(Dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted. Price changes are indicated by italic t

STEELMAKING SCRAP COMPOSITE

Oct. 20	$26.17
Oct. 13	26.75
Sept. 1949	26.07
Oct. 1948	43.25
Oct. 1944	16.50

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	*$29.00*
No. 2 Heavy Melt.	*27.00*
No. 1 Busheling	*29.00*
No. 1 Bundles	*29.00*
No. 2 Bundles	23.00-24.00
No. 3 Bundles	22.00-23.00
Heavy Turnings	22.50-23.50
Machine Shop Turnings	20.00†
Mixed Borings, Turnings	20.00†
Short Shovel Turnings.	22.00
Cast Iron Borings	21.00*
Low Phos. Steel	31.00-32.00*

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
No. 1 Machinery Cast.	39.00-40.00
Charging Box Cast	31.00-32.00*
Heavy Breakable Cast.	28.00-29.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*31.00*
Axles	*35.00-36.00*
Rails, Random Length	*34.00-35.00*
Rails, 2 ft and under	*38.00-39.00*
Rails, 18 in. and under	*39.00-40.00*
Railroad Specialties	*32.00-33.00*
Angles, Splice Bars	*32.00-33.00*

* Nominal.
† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$26.50†
No. 2 Heavy Melt. Steel	25.50†
No. 1 Busheling	26.50†
No. 1 Bundles	26.50†
No. 2 Bundles	23.50†
Machine Shop Turnings	17.00†
Mixed Borings, Turnings	19.00†
Short Shovel Turnings.	19.00†
Cast Iron Borings	19.00†
Bar Crops and Plate	27.50†
Punchings & Plate Scrap	27.50†
Cut Structurals	29.50†

† Nominal.

Cast Iron Grades†

No. 1 Cupola	40.00-41.00
Charging Box Cast	34.00-35.00
Stove Plate	35.00-36.00
Heavy Breakable Cast.	32.00-33.00
Unstripped Motor Blocks	30.50-31.50
Malleable	34.00-35.00
Brake Shoes	31.00-32.00
Clean Auto Cast	42.00-43.00
No. 1 Wheels	35.00-36.00
Burnt Cast	32.00-33.00

† Nominal.

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00
R.R. Malleable	34.00-35.00
Rail, 3 ft and under	38.00-39.00
Rails, Random Lengths	32.00-33.00
Cast Steel	27.00-28.00
Railroad Specialties	31.00-32.00
Uncut Tires	30.50-31.00
Angles, Splice Bars	34.00-35.00

VALLEY

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 2 Heavy Melt. Steel	30.00-30.50
No. 1 Bundles	31.00-31.50
No. 2 Bundles	27.00-27.50
Machine Shop Turnings	19.00-20.00
Short Shovel Turnings.	22.00-23.00
Cast Iron Borings	22.00-23.00
Low Phos.	32.00-33.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$23.50-24.50**
No. 2 Heavy Melt. Steel	*22.00-22.50**
No. 1 Busheling	*22.00-22.50**
No. 1 Bundles	*23.50-24.50**
No. 2 Bundles	*20.50-21.00**
Machine Shop Turnings	17.00
Short Shovel Turnings.	18.00
Mixed Borings, Turnings	*14.00-15.00*
Bar Crop and Plate	*26.00-27.00*
Punchings & Plate Scrap	*26.00-27.00*
Cut Structurals	26.00
Elec. Furnace Bundles.	25.00-25.50
Heavy Turnings	*23.50-24.50*
No. 1 Chemical Borings.	*26.00-27.00*

Cast Iron Grades

No. 1 Cupola Cast	32.50
No. 1 Machinery Cast.	36.00-37.00*
Charging Box Cast	33.00-34.00
Heavy Breakable Cast.	33.00-34.00
Unstripped Motor Blocks	29.00-30.00
Clean Auto Cast	36.00-37.00*
No. 1 Wheels	35.00-36.00*
Malleable	*37.00-38.00*

* Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	22.00
No. 1 Busheling	26.00
No. 1 Bundles	26.00
No. 2 Bundles	20.00
Machine Shop Turnings	12.00
Short Shovel Turnings.	15.00
Mixed Borings, Turnings	15.00
Cast Iron Borings	15.00

Cast Iron Grades

No. 1 Cupola Cast	41.00
Charging Box Cast	31.00
Heavy Breakable Cast.	34.00
Stove Plate	30.00
Unstripped Motor Blocks	20.00
Brake Shoes	22.00
Clean Auto Cast	38.50
Drop Broken Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	27.00
R.R. Malleable	33.00
Rails, Rerolling	37.00
Rails, Random Lengths	35.00
Rails, 18 in. and under	44.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$17.00-18.00
No. 1 Bundles	20.00-21.00
No. 2 Bundles	17.00-18.00
No. 1 Busheling	20.00-21.00
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	12.00-13.00
Short Shovel Turnings.	14.00-15.00
Cast Iron Borings	14.00-15.00
Punchings & Plate Scrap	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-33.00
Heavy Breakable Cast.	28.00-29.00
Clean Auto Cast	32.00-33.00

BUFFALO

No. 1 Heavy Melt. Steel	*$27.00-27.50*
No. 2 Heavy Melt. Steel	*24.50-25.00*
No. 1 Bushelings	*24.50-25.00*
No. 1 Bundles	*25.50-26.00*
No. 2 Bundles	*23.00-23.50*
Machine Shop Turnings.	*18.00-18.50*
Mixed Borings, Turnings	*19.00-19.50*
Cast Iron Borings	*19.00-19.50*
Short Shovelings	*20.50-21.00*
Low Phos.	*28.50-29.00*

Cast Iron Grades

No. 1 Cupola	*37.00-37.50*
No. 1 Machinery	*38.00-38.50*
Mixed Yard	*35.50-36.00*
Malleable	*34.50-35.00*

Railroad Scrap

Rails, 3 ft. and under	*35.00-36.00*
Scrap rails	*30.00-31.00*
Specialties	*31.00-32.00*
No. 1 car wheels	*32.00-33.00*

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$18.50
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	15.00-16.00
No. 1 Bundles	18.00-18.50
No. 2 Bundles	14.00-15.00
No. 3 Bundles	nominal
Machine Shop Turnings	10.00-11.00
Mixed Borings, Turnings	10.00-11.00
Short Shovel Turnings.	11.00-12.00
Punchings & Plate Scrap	22.00-23.00
Cut Structurals	22.00-23.00
Elec. Furnace Bundles	*19.00-20.00*

Cast Iron Grades

No. 1 Cupola Cast	30.00-31.00
No. 1 Machinery	32.00
Charging Box Cast	25.00-26.00
Heavy Breakable	25.00-26.00
Unstripped Motor Blocks	26.00
Malleable	*32.00*

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$17.50-18.00
No. 2 Heavy Melt. Steel	*16.00-16.50*
No. 1 Bundles	17.00-18.00
No. 1 Busheling	14.00-15.00
Machine Shop Turnings.	*9.00-10.00*
Mixed Borings, Turnings	*9.00-9.50*
Short Shovel Turnings.	*11.00-12.00*
Bar Crops and Plate	19.00-20.00
Punchings & Plate Scrap	19.00-20.00
Chemical Borings	*18.00-19.00*

Cast Iron Grade

No. 1 Cupola Cast	30.00-31.00
Mixed Cast	27.00-28.00
Heavy Breakable Cast	*28.00-29.00*
Stove Plate	22.00-23.00
Unstripped Motor Blocks	20.00-21.00

CHICAGO

No. 1 Heavy Melt. Steel	$25.00-26.00
No. 2 Heavy Melt. Steel	23.00-24.00
No. 1 Bundles	25.00-26.00
No. 2 Bundles	22.00-23.00
No. 3 Bundles	16.00-17.00
Machine Shop Turnings	*19.00-20.00*
Mixed Borings, Turnings	*19.00-20.00*
Short Shovel Turnings.	*20.00-21.00*
Cast Iron Borings	*19.00-20.00*
Bar Crops and Plate	29.00-31.00
Punchings	29.00-31.00
Elec. Furnace Bundles.	25.00-26.00
Heavy Turnings	23.00-24.00
Cut Structurals	26.00-27.00

Cast Iron Grades

No. 1 Cupola Cast	41.00-42.00
Clean Auto Cast	41.00-42.00
No. 1 Wheels	33.00-34.00
Stove Plate	*33.00-34.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	31.00-32.00
Malleable	*37.00-38.00*
Rails, Rerolling	41.00-42.00
Rails, Random Lengths	*40.00-41.00*
Rails, 2 ft. and under	*41.00-42.00*
Rails, 18 in. and under	*42.00-43.00*
Railroad Specialties	33.00-34.00
Angles, Splice Bars	35.50-36.50

ST. LOUIS

No. 1 Heavy Melt. Steel	$28.00-29.00
No. 2 Heavy Melt. Steel	25.00-26.00
Machine Shop Turnings.	*20.00-21.00*
Short Shovel Turnings.	21.00-22.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-38.00
Charging Box Cast	34.00-35.00
Heavy Breakable Cast.	32.00-33.00
Brake Shoes	30.00-31.00
Clean Auto Cast	40.00-42.00
Burnt Cast	30.00-31.00

Railroad Scrap

R.R. Malleable	31.00-32.00
Rails, Rerolling	38.00-39.00
Rails, Random Lengths	32.00-33.00
Rails, 3 ft. and under.	36.00-38.00
Uncut Tires	28.00-29.00
Angles, Splice Bars	33.00-35.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	24.50
No. 1 Busheling	
No. 2 Bundles	
Machine Shop Turnings	
Mixed Borings, Turnings	
Short Shovel Turnings.	
Cast Iron Borings	
Bar Crops and Plate	
Cut Structurals	

Cast Iron Grades

No. 1 Cupola Cast	34.00-3
Stove Plate	28.00-3
No. 1 Wheels	23.00-2

Railroad Scrap

No. 1 R.R. Heavy Melt.	2
R. R. Malleable	non
Rails, Rerolling	35.50-3
Rails 3 ft. and under	25.00-2
Angles and Splice Bars	31.00-3

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$1
No. 2 Heavy Melt. Steel	1
Nos. 1 & 2 Bundles	1

Cast Iron Grades

No. 1 Cupola Cast	23.00-2

Railroad Scrap

No. 1 R.R. Heavy Melt.	1
Wheels	3
Rails, Random Lengths	1

SEATTLE

No. 1 Heavy Melt. Steel	$1
No. 2 Heavy Melt. Steel	1
No. 1 Busheling	1
Nos. 1 & 2 Bundles	1
No. 3 Bundles	1
Machine Shop Turnings	1
Mixed Borings, Turnings	1
Punchings & Plate Scrap	2
Cut Structurals	2
Elec. Furnace Bundles.	1

Cast Iron Grades

No. 1 Cupola Cast	25.00-2
Heavy Breakable Cast.	1
Stove Plate	1
Unstripped Motor Blocks	1
Malleable	2
Brake Shoes	17.00-1
Clean Auto Cast	2
No. 1 Wheels	2

Railroad Scrap

No. 1 R.R. Heavy Melt.	1
Railroad Malleable	2
Rails, Random Lengths	1
Angles and Splice Bars	1

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$2
No. 2 Heavy Melt. Steel	1
Nos. 1 & 2 Bundles	1
No. 3 Bundles	1
Machine Shop Turnings	1
Mixed Borings, Turnings	1
Punchings & Plate Scrap	2
Electric Furnace Bundles	2

Cast Iron Grades

No. 1 Cupola Cast	$3

Railroad Scrap

No. 1 R.R. Heavy Melt.	2
Rails, Rerolling	2

HAMILTON, ONT.

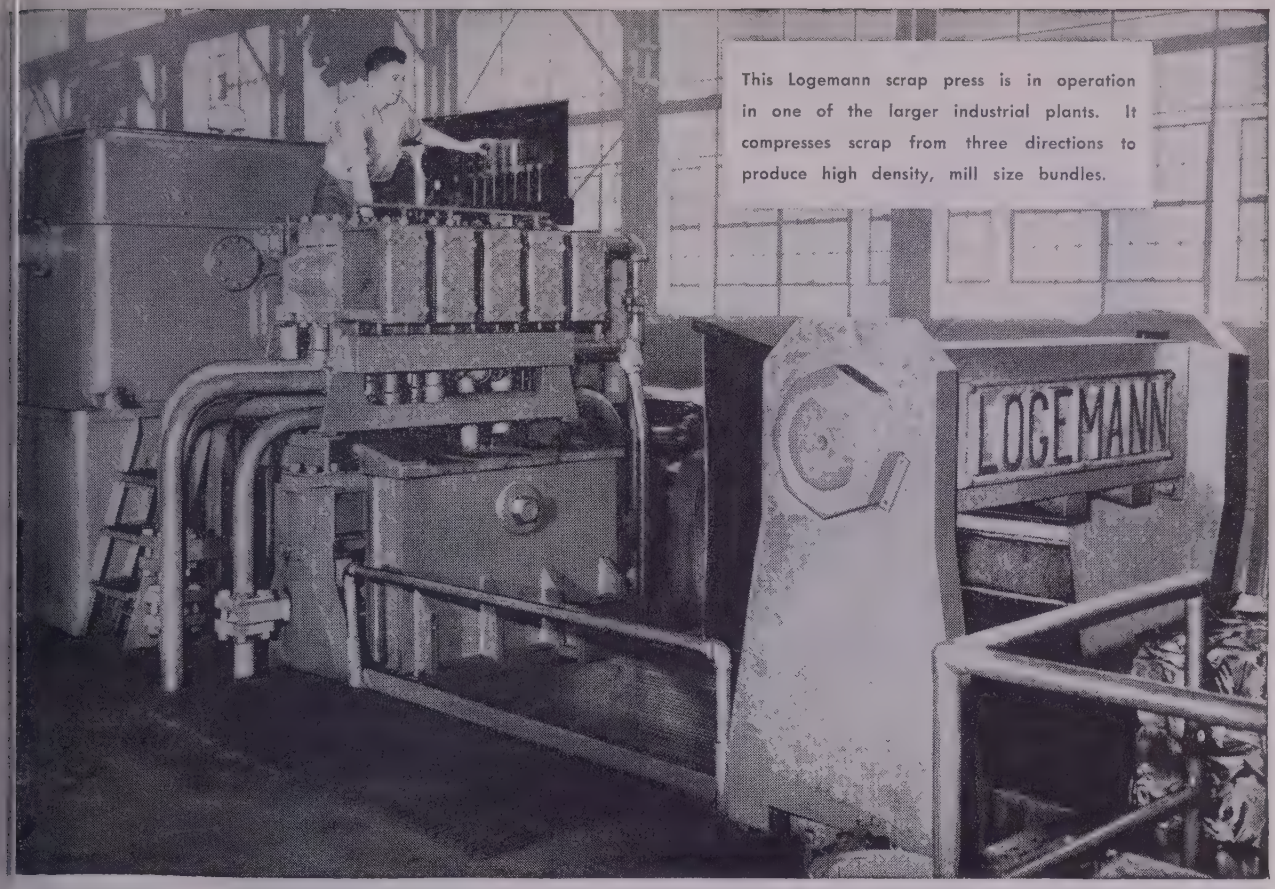
(Delivered prices)

Heavy Melt.	$2
No. 1 Bundles	2
Mechanical Bundles	1
Mixed Steel Scrap	1
Mixed Borings, Turnings	1
Rails, Remelting	2
Rails, Rerolling	2
Busheling	1
Bushelings new factory, prep'd	1
Bushelings new factory, unprep'd	1
Short Steel Turnings	1

Cast Iron Grades*

Cast	33.00-3

* Removed from price cor Aug. 9, 1947; quoted on basis f.o.b. shipping point.



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

elf-contained.....
riple Compression..
utomatically Controlled

LOGEMANN SCRAP PRESSES

andle high tonnages with minimum labor . . . at low cost!

.OGEMANN METAL BALERS

. . are built in a large
nge of sizes to meet spe-
c conditions. Let Loge-
nn's engineering service
lp you arrive at the most
icient and economical
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The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is *no need for specially-trained maintenance crews.*

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Sheets Strip . . .

Sheet and Strip Prices, Page 99 & 100 &

Boston—Delivery of sheets orde for shipment through November problematical. Assuming rolling is sumed in the near future, revisio schedules for tonnage on books time of suspensions, plus schedul of volume taken since, may ext delivery promises on new orders January on hot-rolled sheets and to February and March on cold-rol Three weeks will be required a the strike ends to bring some mills to 85 per cent of capacity. Cutba on some tonnage are likely until ducers eliminate arrearages. Me while, users of flat-rolled products inventories steadily decline, altho curtailments in metalworking op tions are not yet serious. Cold-ro strip supply is freer than that sheets. Production of cold strip h up well with one leading produ down. Hot-rolled strip demand heavier. Converters have cut dee into hot-strip reserves than expec some already needing additional st Producers are more selective in t ing new volume on both high and carbon. As expected, builders household fuel tanks using he gage hot-rolled sheets are short stock.

Bethlehem Steel Co. has receive contract for 1200 tons, deep-draw cold-rolled sheets for Massachus automobile plates at 4.85c, Sparr Point, Md., or 5.47c, delivered C lestown Prison, Boston

New York—The majority of s sellers are accepting orders for f quarter. Those mills down beca of the strike assert they were boo up for the entire quarter, on s grades even before the walkout. T have tonnage that can't be mo until after the turn of the year, gardless of how soon a labor set ment is made, but are accepting a tional orders from regular custom At least one mill, which has been affected by a labor walkout not accepting any tonnage for f quarter. This producer has tonn only in certain specialties, includ stainless sheets, for shipment in current quarter.

District sheet metal shops h maintained good operations since beginning of the steel strike, several will curtail this week stocks are becoming unbalanced.

Philadelphia—Sheet steel produc will be forced to go on allocation o mill operations are resumed. C sumers also face the prospect o possible price increase, depending the final settlement of the labor d pute. Some buyers are holding until they can gage outlook more curately. Sheets are still the m active of all products except possi pipe. Most producers are accept orders from regular trade for s ment after turn of the year. Buy is not as heavy as two weeks ago, consumers are becoming less sure their future positions. Most are dering ahead on theory they always cancel in event they do need the tonnage.

Pittsburgh — Operating sched among metalworking concerns h are not expected to be adversely fected by unbalanced stocks of sh

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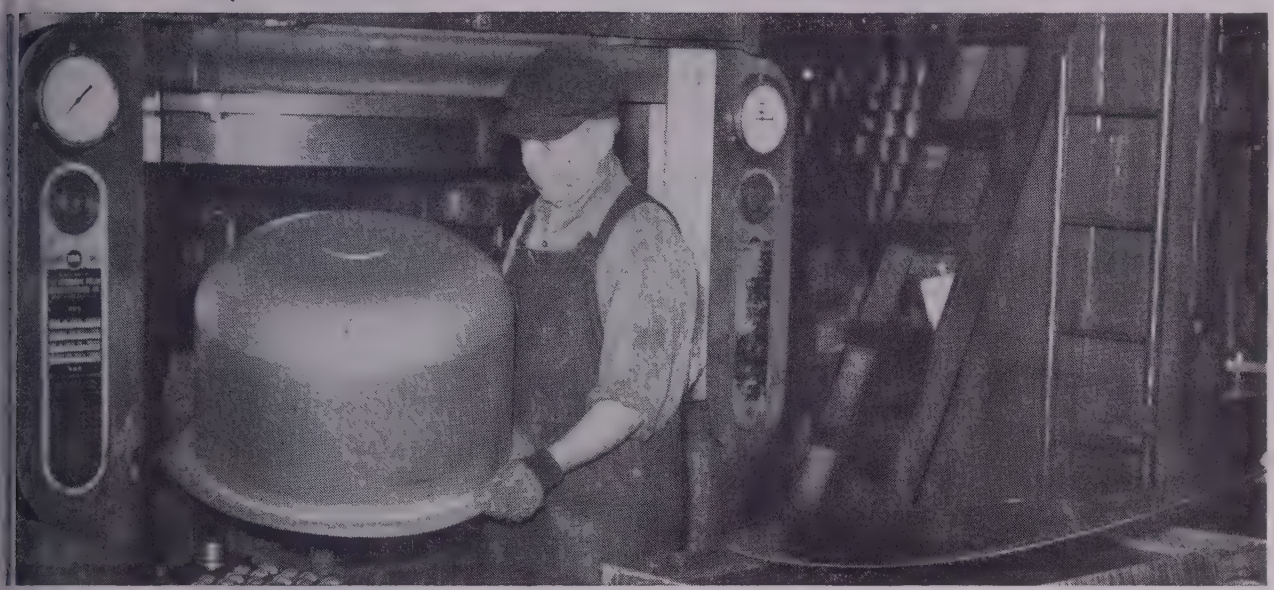

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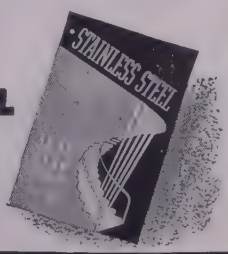

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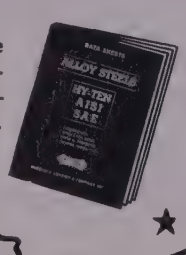

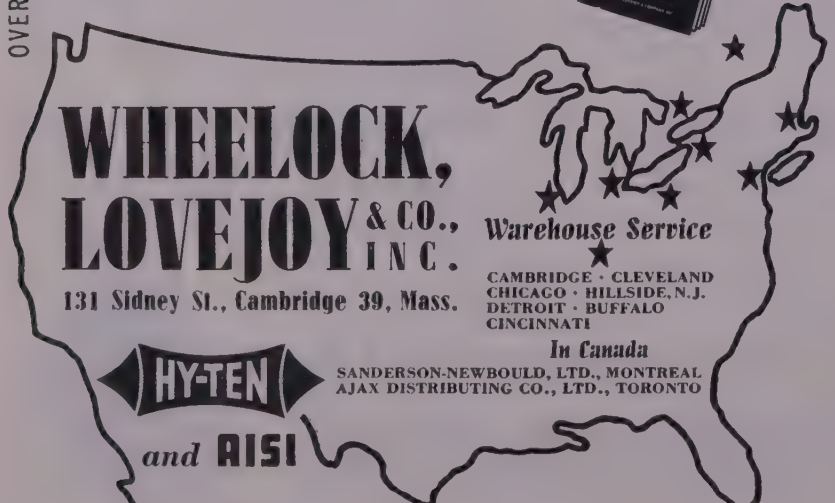

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and strip until early next month. U balanced stocks of component pa are major threat to continued ope tions. Westinghouse Electric Co probably will begin tapering produ tion schedules about Nov. 1, at East Pittsburgh and Mansfield, plants. The government's grain program will not be so adversely fected as earlier feared. Weirton a Armco are still producing galvaniz sheets in large volume, while galva izing pots at two nonintegrated st plants previously shut down are operation. In some instances alun num has been utilized as a substitu

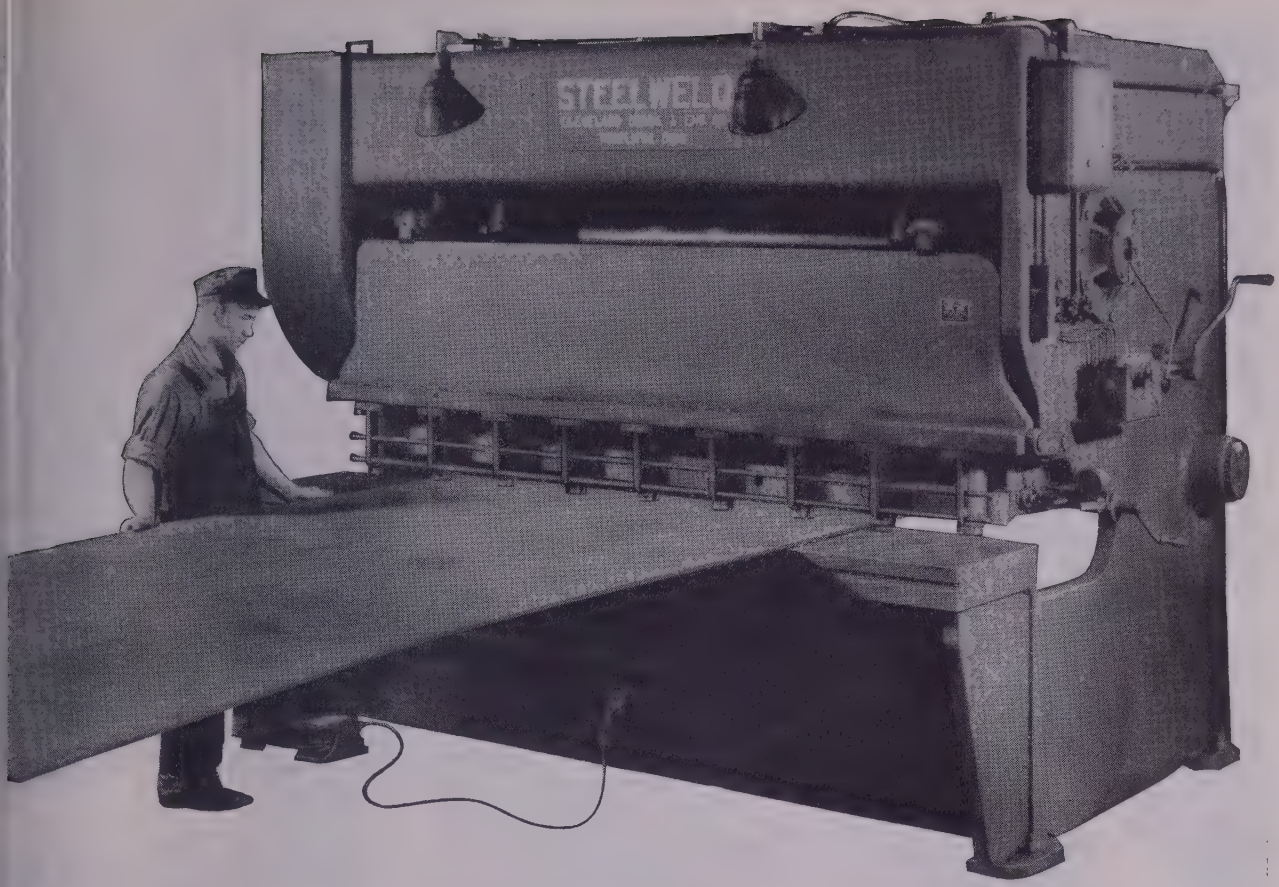
Chicago—Steel consumers are ing warned to review their produ tion schedules since it will be an e tended time after the strike is settl before distribution gets back to n mal. The quota system, as forme applied may not be used because d mand at end of the strike will huge but probably relatively sh lived. First to catch up probab will be structurals and rails, th plates, bars, and finally pipe a sheets. Cold-rolled and galvaniz sheets, tin plate and pipe will longest in demand, shortest in supp Probably in only the latter items w formal allocation be necessary aft the initial rush for steel is handl On the basis of orders in hand some local mills, February appea to contain the earliest open rolli capacity for sheets if the strike we settled today.

Milwaukee—Wholesale layoffs lik ly will start here at metalworki plants if the steel strike continu ten more days. The situation is critical yet. Several local concer including electrical apparatus make are getting order cancellations. number of others, making parts f steel mills and closely allied indu tries, however, have received orde since Oct. 1 and are under instru tions to ship as soon as the stri is settled.

St. Louis—Sheet demand continu to increase sharply here as manufa turers of metal products marketab in the east expand operations to ma imum to take advantage of shortag created in areas affected by the ste and coal strikes. Local sheetmake have filled books through the fir quarter and have not opened tho for the second quarter. There is flood of "phantom" orders whi fabricators are attempting to pla as protection against a long strik

Los Angeles—The real pinch flat-rolled products has not yet d veloped, but it is not far off. She supplies generally are still libera but cold-rolled and galvanized mate ial is extremely tight. Consumers cold-finished strip in many instanc had worked off much of their inve tory prior to the strike. Despite t fact two cold strip mills in this di trict are producing at capacity, su plies of this product are far fro adequate.

San Francisco—Supplies of lig gage galvanized sheets have pra tically disappeared in this distric Heavier galvanized sheets are ava able, but stocks are dwindling rapidl Supplies of hot and cold-rolled shee are more plentiful, but heavy deman especially for hot-rolled items, ind cates sharp reduction of inventori by end of this month.



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Tubular Goods . . .

Tubular Goods Prices, Page 102

Boston—Buying of cast iron pi is heavy for this season, orders f better than 3000 tons having bee placed last week. Distributor's me chant steel pipe stocks are becomir more unbalanced and their invent ries, none too large when strik started, are steadily falling. Ear pressure on mills is expected. Sinc withdrawal of consigned stocks, di tributors have been more conservativ in carrying inventory and they wer following this policy when the flo of new supplies was shut off.

Pittsburgh — Jobbers are exper encing a sharp increase in deman for pipe and tubing items. In mos instances these interests are allo cating shipments from rapidly dwir dling inventories. Some line pip construction programs have been cur tailed or temporarily abandoned.

San Francisco—Shutdown of larg diameter pipe producing facilitie soon will affect some major pipe line projects. Smaller pipe generall is in better supply in this area.

Seattle—Cast iron pipe agencie report small sales out of stock, bu the market generally is quiet. Larg consumers, who bought heavily dur ing the shortage, are well stocke and will remain out of the marke for several months.

Steel Bars . . .

Bar Prices, Page 99

Philadelphia—Hot carbon bar pro ducers generally declare that, if ther is an early settlement of steel strike they will be able to make shipment against new orders before the end o year. There is active demand fo bars for near-by shipment as indi cated by pressure on jobbers. A the same time, there is less interes in future positions, due not only t uncertainties as to mill deliveries bu also as to requirements some few weeks off. Cold-drawn bars are i good demand, but trading is handi capped by unbalanced stocks.

New York—Hot carbon bar con sumers can place orders for shipment this year, subject to early adjustment in the steel labor dispute. Various mills at the beginning of the strike had been promising shipment within three to four weeks. In certain in stances tonnages now being booked can't be handled until after Jan. 1.

Boston — While mild improvement in demand for some products fabri cated from carbon bars is maintained including files, bolt and nut special ties and small forgings, consumption has not seriously taxed inventories. Bar mills are in a position to sched ule ahead of most other products once rolling is resumed and some firm de liveries for December appear possible should production start by early November. Bar orders are being ac cepted on basis of earliest delivery possible, but in some instances mills are not taking volume beyond Janu ary.

Los Angeles—Supplies held by bar fabricators average two to three weeks; warehouse stocks are fairly good. One manufacturer of indus trial items, whose bar inventory is

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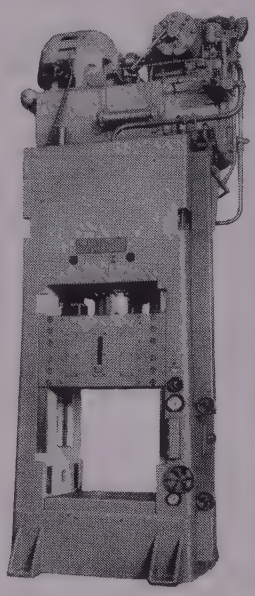
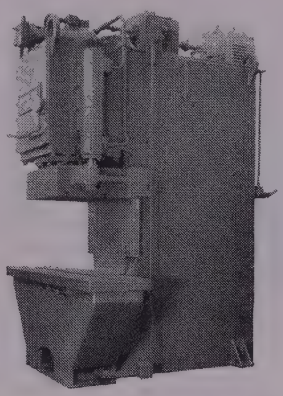
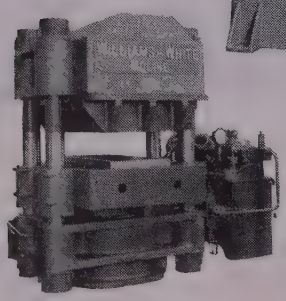


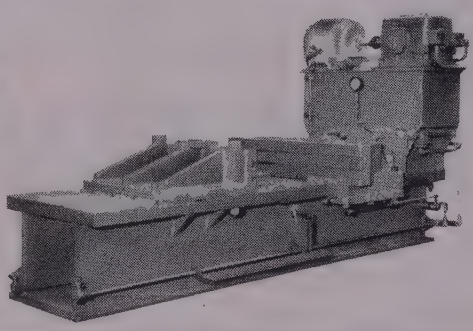
At right: 500-Ton Hydraulic Housing Press: Bed and ram area, 48 x 48 in.; Daylight opening, 54 in.; Stroke, 36 in.; Drawing speed, adjustable; Hydro - pneumatic die cushion.

Below: 500-Ton Hydraulic Gap Frame Press: Platen surface, 24 x 96 in.; Throat, 18 in.; Daylight opening, 30 in.; Stroke, 24 in.



Below: 600-Ton Column Moving Up Hydraulic Press: Platen surface, 42 x 60 in.; Daylight opening, 24 in.; Stroke, 12 in.





At right: 200-Ton Hydraulic Bulldozer, with adjustable end lug. Die space, 36, 48 and 60 in.; Stroke, 24 in. Foot button or treadle control.

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exceptionally large, reports that a secondary reaction has set in, wi some of its customers cancelling extending orders for its products.

San Francisco—Large inventor of bars, plus production from plan not affected by the strike, indica no serious supply problem in th product.

Plates . . .

Plate Prices, Page 99

Philadelphia—Some tank fabric tors claim they are in no immedia danger of curtailment, at least ins far as steel supply is concerned. certain instances, this may be d to the fact that two plate mills a still operating in this district. Sou Chester Tube Co., Chester, Pa., h been forced to suspend because lack of skelp. The two district pla mills in operation are now booked i to December. That backlogs ha not become still more extended might be expected with so mu plate capacity affected by strik may be ascribed in part to conti ued dull demand from railroads, and gas industry and ship yar Strong pressure still prevails f light gage plates for fuel oil tan and domestic heating equipment.

New York—Backlogs of the tw eastern plate mills still in operati continue to expand, with little n available under six to seven weel Meanwhile, other producers who plants are strike-bound report a fa amount of demand from various co sumers who are running short plates and endeavoring to get pr ferred positions on mill schedul Some plate fabricators are curtailin operations due to unbalanced su plies.

Tank fabricators are experiencing continued drop in industrial requir ments. Public demands have increas appreciably as a result of exceptio al droughts this summer in many se tions of the country. Backlogs most tank shops are down noticeabl One interest, for instance, repor backlogs of only three to four month as against 10 to 11 months a ye ago.

Boston—Plate demand is featur by heavier requirements for lar diameter pipe in connection wi Metropolitan District commissi water lines, taking close to 3000 ton Plates for fabrication of this pi may not be available to meet delive specified; bulk of tonnage will be fa ricated in Holyoke, Mass. While son tonnage is trickling in from tw Pennsylvania mills, inventories he by tank and other fabricators are d clining steadily.

Los Angeles—Fabricators and jo bers report that plate supplies a comparatively good, with dema generally showing little urgenc Moreover, with Kaiser's plate mill Fontana in operation, this categor probably is in the most favorab supply position of all flat-rolled pro ucts.

Seattle—Inquiry for plates is i active and smaller plants are cu tailing operations. Orders consi mainly of tonnages under 100 ton The largest pending project is th Lucky Peak tunnel for which 14 tons of lining plates will be require

Wire . . .

Wire Prices, Page 101

Boston—Although starting to run ort on some sizes, wire consumers, luding screw producers, are not seriously affected by the strike. ere are exceptions, but fresh sup- of wire has not halted entirely ce several producers are operating. st drawers have fairly wide stocks rods. Screw manufacturers are also awing rods to wanted sizes in some tances. Demand for screws is more ive with some tendency toward ward buying. Aircraft volume is reasing; United Aircraft Corp., st Hartford, Conn., recently booked $7,114,933 Navy order for engines d propeller assemblies. Aviation pply Office, Philadelphia, is clos- on a large wire rope inquiry for rious deliveries.

Tin Plate . . .

Tin Plate Prices, Page 100

Pittsburgh—Most can companies ve fairly large inventories of tin ll products, although some curtail- nt in production schedules may be essary early next month because unbalanced stocks. Sellers' in- tories were nearly depleted prior the start of the strike Oct. 1. This uation, combined with necessity to uild customers' stocks, should re- t in near capacity production edules for an extended period fol- ving termination of the strike. llers have received sizable orders ce Oct. 1 for as early scheduling possible at strike's end. Since lls had relatively little stock on nd Oct. 1, these orders can not be ed until previous order backlog nging from 6 to 8 weeks has been pped.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 99

Chicago—Fabricators are engaging a serious game of cross-hauling el to keep their jobs moving on edule. Sizes are running out now, t fortunately the shortages are ggered well enough among various nts so that the repercussions of strike are relatively minor as yet.

Los Angeles—Construction is vir- lly at a standstill, due chiefly to a ike of engineers operating sand d gravel equipment. Nearly every in the Los Angeles area is shut vn, with consequent effect on all crete construction projects. This nes at a time when building was ergoing a sharp increase. During ptember, permits for commercial nstruction in ten Southern Cali- nia counties rose 29 per cent in llar volume over the preceding nth; new industrial construction, er cent; private institutional build- , 33 per cent.

San Francisco—No immediate dif- lty is foreseen in reinforcing ma- ial. Inventories are estimated suf- ient to meet most needs until Dec. Three West Coast plants are ducing: Kaiser's Fontana, Judson el Corp's Oakland, and Pacific tes Steel Corp.'s Niles mill.

Seattle — Volume of inquiry for

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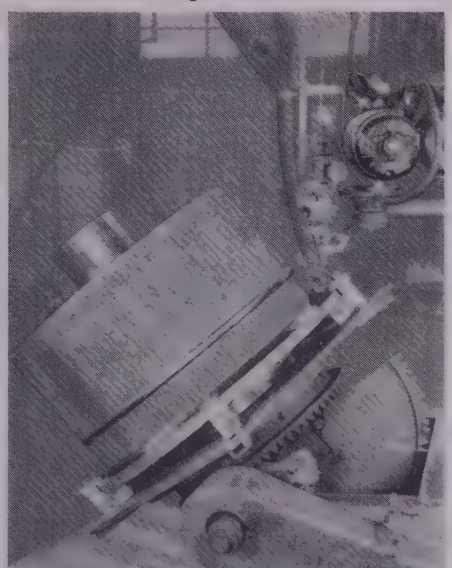

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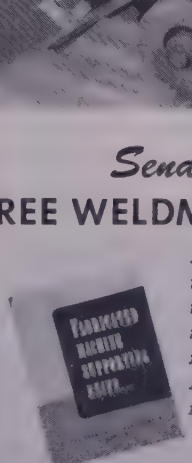

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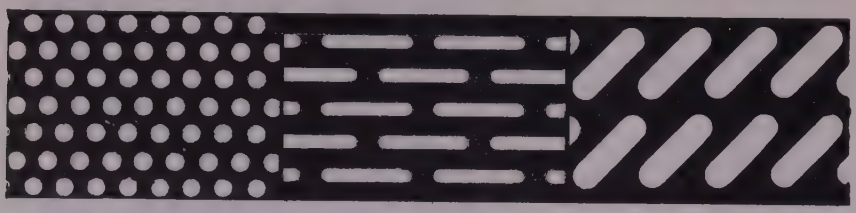

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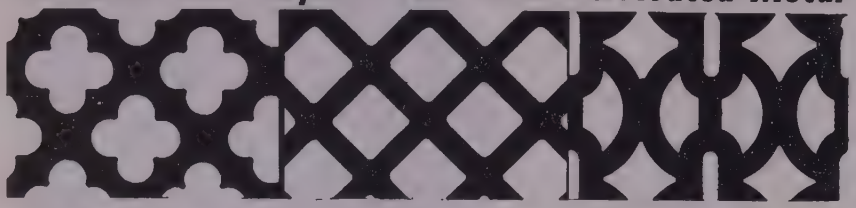

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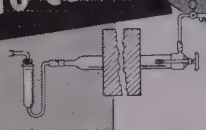

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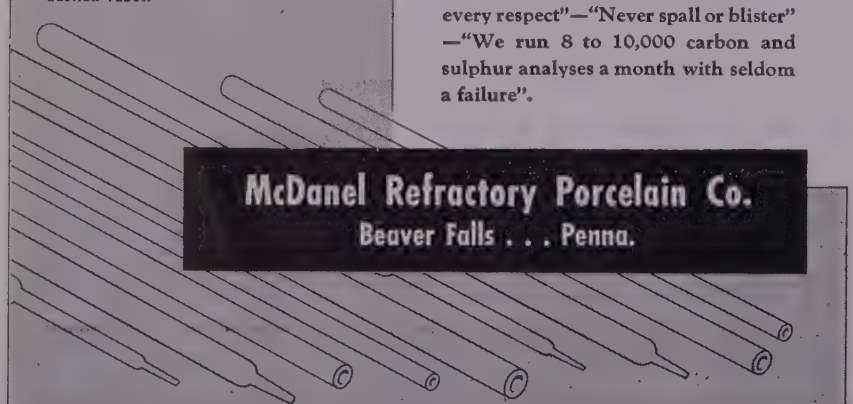

McDanel Refractory Porcelain Co.
Beaver Falls . . . Penna.

reinforcing materials is fair, esp cially in small tonnages. Some bus ness has been diverted from strik bound plants to Northwest Ste Rolling Mills Inc., which is operatin at capacity.

Tool Steel . . .

Tool Steel Prices, Page 101

Pittsburgh—Braeburn Alloy Ste Corp., Braeburn, Pa., was closed b a strike Oct. 15; other leading to steel producers in this area continu in operation. Allegheny Ludlum Ste Corp.'s contract has been extende to Nov. 1. Those tool steel interes still operating report no marked in crease in orders. Customers' stock apparently are adequate in most in stances in spite of strike possibilit for tool steel producers.

Structural Shapes . . .

Structural Shape Prices, Page 99

New York — District fabricatin shops are maintaining operation but are nearing the squeeze-point, a stocks are becoming unbalance Certain fabricators are confronte with expiration of labor contrac which may spell trouble in the ne future. Inquiry has eased somewha due both to the unsettled labor sit ation and seasonal influences.

Boston—Bridge shops account f bulk of structural tonnage place District shops are taking small tonnage contracts with backlog gradually lower. Most fabricato will not be pinched for plain materi for some weeks. Most of the larg fabricating shops are operating wit an escalator clause, while small-l work usually is based on firm bid Elliot street bridge project, Bosto involving 400 tons, will be of welde construction.

Philadelphia—Structural demand light. Later in the year, substanti inquiries are expected for weste extension of the Pennsylvania Tur pike. Only one small order has bee placed against this program to dat Shape mills still are accepting orde for shipment this year, assuming reasonably early settlement of ste strike.

Pittsburgh—Activity among stru tural fabricators is fairly well su tained. Outlook is not promisin however, because of difficulty in o taining odd size specifications f work booked since mid-Septembe Wide flange beams particularly a in short supply. New inquiries a largely limited to public work. Son new contracts have been made b fabricators since Oct. 1, but the have been restricted mainly to jo requiring standard size structur items. Most fabricators have plac orders with mills for early schedu ing following end of the strike.

San Francisco — Although son structural fabricators may find di ficulty in filling needs for specializ products, overall inventory positi in structurals is good.

Seattle—Fabricators are seekir new contracts as backlogs are sma Inventories are sufficient to insu operations for about 60 days. N many projects involving large to nages are up for bids.

ig Iron . . .

Pig Iron Prices, Page 98

New York—Pressure on the few astern seaboard furnaces still in oper- tion continues heavy, inquiries com- g from as far away as the middle est. There is also substantial de- and for coke from remote sections. ome of these requirements for coke nd pig iron are being met. Mean- hile, some interest is developing in utch iron which is offered at around 47, f.o.b. eastern seaboard. The iron foundry grade, sand cast, high in hosphorus and low in manganese. eliveries are around three to four eeks. Some offerings at around ame level are being made by Austria nd Luxemburg. No transactions ave been reported except in some oyal Dutch iron, which was sold at oncessions as off-grade material, to upplement supply of cast scrap.

Boston—Stocks of basic iron held by eelworks which are still operating re fair, sufficient for about 30 days in ne instance. Prolonged suspension ould be serious with basic consumers, ue to shutdown of furnaces supply- ng this grade. Mystic furnace pro- uction is going largely into con- mers' hands and less tonnage to ockpile. Foundry melt this month aintains the improvement which arted in late summer.

Pittsburgh — Jobbing foundries re- ort a sharp drop in new orders, con- equently some have curtailed opera- ons to two or three days per week. oke supply, rather than pig iron, chief production bottleneck. Found- es serving the radiation industry ave been very active and are feeling he coke shortage. Merchant foundry on supply appears adequate, with ocks among foundries estimated to xceed more than three weeks' re- uirements. Pig iron stocks built up y the leading merchant blast furnace nterest through spring and summer onths have been depleted.

Philadelphia—While the few east- rn blast furnaces still in operation re confronted with good near-by emand from foundries, they never- heless are able to meet some needs om as far inland as Ohio. The hester, Pa., blast furnace of Allied on Works Inc., which has been own for several months, is being ffered for sale at a price substan- ally below amount expended by the mpany last year in improvements.

Buffalo—Tonawanda Iron Division, merican Radiator & Standard Sani- ary Corp., has blown-in its idle blast rnace after a five-month shutdown. portion of output will move into tside consuming channels. The com- ny's contract with USW does not pire at this time. No serious cur- ilment in operations is noted among undries because of the steel tieup. oke shipments continue to decline. alleable melters are hard hit by the lling off in railroad demands.

Cincinnati — Foundry melt con- nues unchanged at the higher level tained in September. Pig iron sup- ies are adequate. Melters are or- ring normally, without attempting build inventories because opera- ons may be curtailed by a shortage coke should the steel strike be olonged.

Milwaukee—Users of gray iron stings continue to specify, the di- rect effects of the steel strike so far being limited. Consensus is that a sudden drop in demand is just around the corner and probably will come before pig iron and coke supplies give out. Some nonferrous foundry operators think their product will be needed to fill in at some applications when gray iron shops are forced to close for lack of raw materials.

St. Louis — Strike-spurred demand for castings has pepped up calls for pig iron by some foundries, although other foundries report order cancellations for the same cause. Ample iron is available to local consumers, but only a few outside orders are being accepted. A coke shortage is the worst threat to iron production. Koppers Co. at Granite City, Ill., has slowed its coke ovens to conserve coal.

Birmingham—Demand for pig iron is extremely heavy. The district's two merchant melters are producing at capacity, but cannot come close to meeting the abnormal demand. While most of the output is consumed regionally, demand from other quarters is insistent.

Seattle — Foundry operations are declining and do not exceed 50 per cent of capacity. No pig iron is immediately available, but plants have inventories for present needs. Colorado Fuel & Iron Co., is offering in this area on a competitive basis with Provo, Utah, by absorbing freight.

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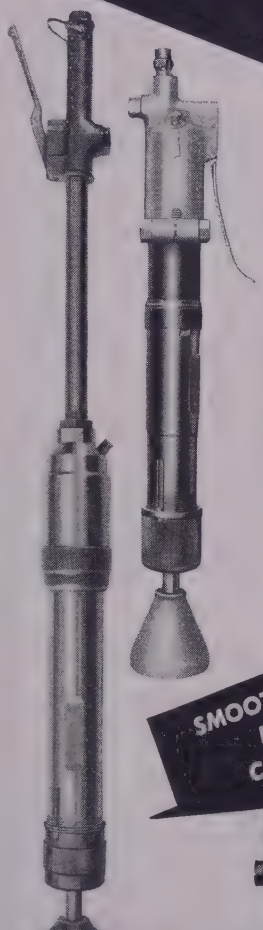

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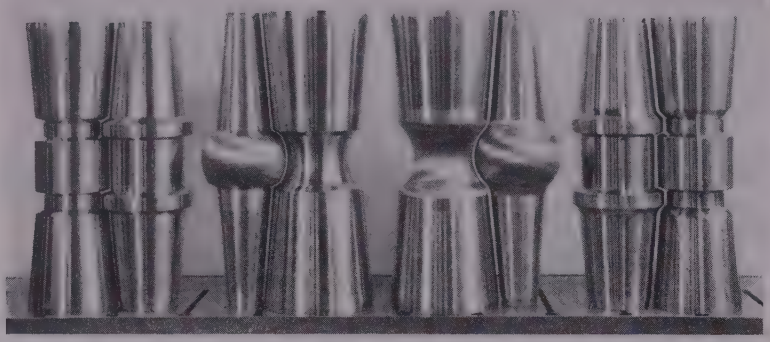

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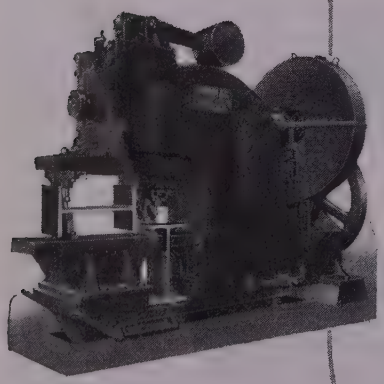

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22

Scrap . . .

Scrap Prices, Page 106

Pittsburgh — Some weakness open-hearth scrap quotations de oped last week with at least one purchasing a sizable tonnage c posed of small lots, at $29 for N heavy melting, off $1. Purchases No. 2 heavy melting steel at $27, 2 bundles at $24, and No. 1 railr heavy melting at $31 were noted. No dealer or broker offeri for industrial No. 1 heavy melt were reported below $29. Those m in position to accept scrap shipme reason it is to their advantage enter the market during curr period of limited competition available scrap and weakening p levels. Such action should also h stabilize quotations following tern ation of strike when there otherw conceivably could develop heavy purchases with resultant sharp turn in quotations. No transacti in turnings were reported, w activity in cast scrap was restrict Some railroad lists have been wi drawn because of inability to fin "home," reduction in line crews desire to stabilize the market dur absence of mill buying on la scale.

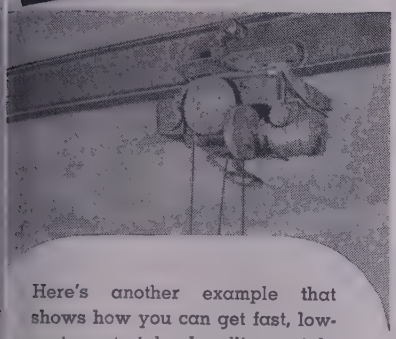
Philadelphia—Steel scrap quo tions are easier on the basis of so sellers' offering prices. There been no recent mill buying to est lish a definite market, although so may develop shortly. No. 1 he melting is holding nominally $23.50-$24.50, delivered. Other le ing open-hearth grades also are n inally lower. Mixed borings, crop and plate and punchings plate scrap are lower, while No chemical borings are higher. Und tone in cast grades is sligh stronger, although there is no pr change except in malleable which higher at $37-$38, delivered.

Boston—One operating steel pl is paying $18.50, including broke fee, for No. 1 heavy melting st while $16-$16.50 holds for No. Buying is spotty in car lots, but ste making grades are generally stea with demand for bundles slow. Fou ry demand is also slow, but c grades display no price weakness

New York—Steel scrap trading extremely dull. Prices on all ma open-hearth grades are nominally changed. Brokers have reduced el tric furnace bundles to $19-$20 f. shipping point. Some trading c tinues in the cast grades, but w the exception of malleable, brok buying prices are steady. Malleable higher at $32.

Chicago—Limit of scrap yar capacity is about reached here a expectations are that production c tailments by many metalworki plants in the near future will ab coincide with the time dealers m stop buying for lack of storage spa Brokers are buying only limited t nages, largely for shipment to o of-town mills. Prices for ma steelmaking grades are steady strong. Prices of turnings are higher. Machine shop turnings quoted at $19-$20; short shovel tu ings, $20-$21; cast iron borings, $ $20. Cast iron grades continue

HOW ONE PLANT *Streamlines* MATERIAL HANDLING



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good demand, foundries stretching their pig iron supplies with more scrap and generally continuing to operate at unchanged levels. Stove plate is bringing $33-$34. Most strength is demonstrated in railroad scrap, lists closing at higher prices for several grades. Delivered price of malleable is $37-$38; random length rails, $40-$41; 2-foot and under rails, $41-$42, 18-inch and under rails, $42-$43.

Buffalo—With leading dealers reducing yard prices on material received, scrap prices dropped $1 a ton here. No. 2 heavy melting and related items are quoted at a range of $24.50-$25 a ton. Except for activity in dealers' yards, trading is virtually at a standstill. Collections at yards is also light. Dealers are taking losses on material being unloaded from railroad cars to escape demurrage charges. Cars had been loaded in hopes of an early break in the steel tieup. Small sales of cast material are being made at declines hovering around $1 a ton.

Cincinnati—Scrap prices are unchanged. Some dealers are withholding material in anticipation of an upturn in demand when the steel strike is settled. Tonnage is moving to Armco Steel Corp.'s Hamilton and Middletown plants. Foundry demand is rather spotty.

St. Louis—Scrap buying has dropped off after two weeks in which the district's two biggest consumers laid in most of their winter needs, mostly No. 2 melting steel and short shovel turnings. Much of the No. 2 came from remote points at $28, delivered, compared to the $26 local price. The interest in turnings at $22 resulted from a desire for quicker delivery from local stockpiles. Shipments are relatively good, but some consumers are being hurt by the Missouri Pacific Railroad strike. Missouri Rolling Mill Corp., for example, is on a Mo-Pac siding and is compelled to unload scrap deliveries from a nearby Frisco siding at heavy expense for extra switching, trucking and handling. Demand for cast grades, moderate for several months, are better than usual.

Los Angeles—Scrap market shows little activity, with foundry demand slow, and only one major mill specifying. Prices are steady.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 102

Pittsburgh — Cessation in oven foundry coke output at those plants closed by strike has been offset somewhat by continued operations among a number of independent interests. Coke is being shipped into this district from Fairmont, W. Va., and to lesser extent from such remote points as Milwaukee and Indianapolis. Many foundries had about 3 weeks' supply of coke at the start of the UMW strike in mid-September. In many instances this stockpile has been supplemented during the interim and has been lengthened by curtailment in foundry operations. Several foundries in this area will be forced to shut down because of lack of coke should the coal and steel strikes last through the remainder of this month.

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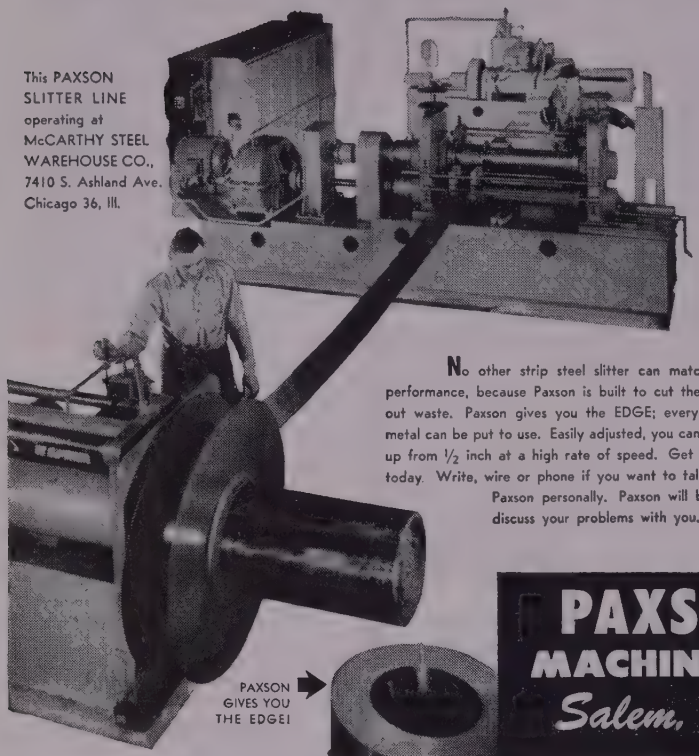

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Warehouse . . .

Warehouse Prices, Page 103

Pittsburgh—Should the steel st continue past Nov. 1, many distr tors inventories would be depleted practically all products. Some inter have no stocks of wide-flange be and galvanized or plain hot-rolled cold-rolled sheets. Some have ra large inventories of hot-rolled cold-finished bars. A marked up in demand for aluminum sheets noted. Daily average shipments f warehouses this month are well 100 per cent of those recorded like September period. Many inqui have been received from consun outside this district, but wareho are restricting acceptances to r lar customers and, in many instan have limited tonnages to a frac of those requested. City deliv price differential remains at 15 ce

Philadelphia—Jobbers report active demand, but inquiry is quite as brisk as a week ago. C sumers are finding it more diffi to get some of the specifications quired, even from warehouses, inventories are getting out of ance. Hence, there is less certai regarding future operations. Ot adverse factors are developing lating to labor and cutbacks in e use requirements.

Cincinnati—Rapid inroads are ing made into stocks of jobbers, v a pinch already developed in sh and structurals. Big tonnage or are offered by fabricators whose supplies have been cut off, but informal rationing plan is in effec

Chicago—Inventory balance, overall tonnage in the shop, is problem at most warehouses. If strike grinds on long enough to f closure of a large segment of metalworking industry, most w houses will be well stocked in s sizes of products. Warehouses w in the process of balancing in tories when the strike hit. T hadn't built up the stocks they mally would carry in cold-rolled, vanized sheets or pipe. Other terials generally were ample to duct normal business. There wer few products, including stainl which had been neglected when opportunity to stock up arri

Milwaukee—Distributors with a few mill suppliers are at a tinct disadvantage. A number the warehouses which have been ting steel from mills still in op tion now say that the tremend pressure by customers for direct s shipment from these mills is prev ing intake of the required amount several products.

Birmingham—Warehouse dem for steel is brisk. Supplies gener are satisfactory, except for some the more popular sizes in structur Plates and black sheets are in latively good supply; galvani sheets are extremely scarce. W house stocks are adequate to m regular requirements for another days.

Los Angeles—Jobbers' sheet sto are low, but not exhausted. Galv ized and cold-rolled sheet supplies extremely tight. Another pinch r be in the making in such speci items as aircraft steel, which in m

ances are not produced locally.

an Francisco—Most jobbers are cating supplies. Orders for car- lots are being refused, and old omers are being given preference. ing is orderly with bulk of de- d coming from steel users who ght directly from mills prior to strike.

eattle—Wholesale jobbers were stocked when the steel strike n and are meeting a normal de- d out of inventories. If the shut- n continues for thirty days, stocks many items will be depleted.

on Ore . . .

Iron Ore Prices, Page 102

leveland—Shipments of Lake Su- or iron ore from the upper lake s have dropped sharply and will e to a complete halt soon if the l strike is continued much longer. ments for the week ended Oct. amounted to only 169,371 tons pared with a weekly average of 2,400,000 tons for the season r to the start of the steel strike. ments from United States ports raged only 16,638 tons daily in week ended Oct. 17 compared an average of over 300,000 tons y in September.

otal shipments for the season to 17 amount to 68,133,373 tons nst 70,707,682 tons in the like od a year ago. While shipments United States ports are off 7,734 tons, those from Canadian s are 513,425 tons larger.

UCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

tons, apartment, 11 Riverside Drive, New k, to Bethlehem Steel Co., Bethlehem,

tons, new agricultural library, Cornell versity, Ithaca, N. Y., to Bethlehem l Co., Lackawanna, N. Y., John W. yper Co., Buffalo, general contractor.

ons, state highway bridge superstructure, tinuous plate girder, U. S. route 2, urg-North Hero, Vt., to American Bridge Pittsburgh; bids Oct. 7, Montpelier.

ons, tainter valves, trash racks, bulk- ds, etc., McNary dam navigation lock, United Engineering Co., San Francisco, $122,700, by U. S. Engineer, Walla lla, Wash.

ons, five-span WF beam bridge Vermont te 15, Cambridge, Vt., to Vermont uctural Steel Co., Burlington, Vt.; Oscar son, Montpelier, general contractor.

ons, state bridge, Wayne county, New k, to Phoenix Bridge Co., Phoenixville, P

ons, 300-foot twin span bridge, Quine- ig river, Canterbury-Plainfield, Conn., to enix Bridge Co., Phoenixville, Pa.; Cam- ella & Cardi, Cranston, R. I., general ractors; Plantation Steel Co. will fur- 40 tons reinforcing bars.

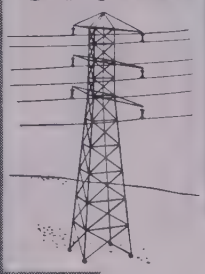
ons, two state King county bridges, to lehem Pacific Coast Steel Corp., Seattle; e Construction Co., Seattle, general con- tor.

ons, freight terminal for Consolidated ghtways, Seattle, to Isaacson Iron ks, Seattle; Sellen Construction Co., gen- contractor.

ns, Greenville garage, Jersey City, N. J., to Keystone Structural Steel Co.

ons, Washington state bridge, Methow , to Consolidated Western Steel Corp., tle; State Construction Co., Seattle, gen- contractor.

IF IT'S IRON OR STEEL



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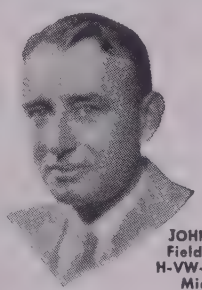

JOHN D. KERSHAW
Field Representative
H-VW-M Grand Rapids
Michigan Office

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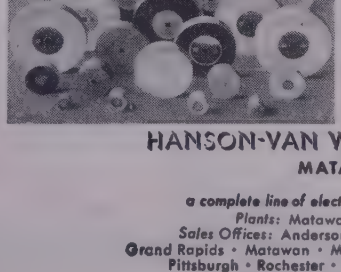

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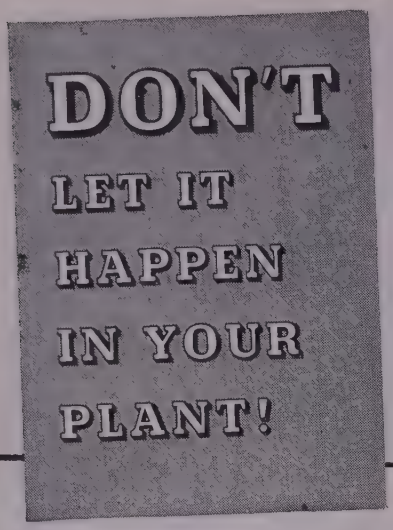

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165 tons, section of state road development, Westchester county, New York, to American Bridge Co., Pittsburgh.

160 tons, plant building, E. R. Squibb & Sons, New Brunswick, N. J., to Irvington Steel & Iron Works, Irvington, N. J.

115 tons, state road development, Westchester county, New York, to Jones & Laughlin Steel Corp., Pittsburgh.

110 tons, three-span composite deck bridge, Naugatuck river, South Leonard street, Waterbury, Conn., to Phoenix Bridge Co., Phoenixville, Pa.

Unstated tonnage, veterans hospital and utilities, Ann Arbor, Mich., to Whitehead & Kales, Detroit; J. D. Hedin Construction Co., Washington, general contractor; reinforcing bars to Pollak Steel Co., Cincinnati.

STRUCTURAL STEEL PENDING

2000 tons, East River drive, adjacent to United Nations development, New York; bids being asked through the president of the Borough of Manhattan.

1435 tons, bridge No. 25, United States project for the improvement of the Cuyahoga river, Cleveland; bids Nov. 10.

1000 tons, connecting bridge, Northern Blvd., Queens, New York; bids being received through office of the president of that borough.

700 tons, modernization of service building, H. J. Heinz Co., Pittsburgh; bids Nov. 3.

350 tons, hospital, Harrisburg, Pa.; bids Nov. 2.

400 tons, Elliot street bridge, Boston; Monroe & Langstroth, North Attleboro, general contractors.

120 tons, state bridge, Monroe county, Pennsylvania; bids Oct. 28.

100 tons, single span, composite deck, welded web girder bridge, Shelton, Conn.; bids Oct. 31, Hartford.

Unstated, steel frame warehouse for California Bag & Metal Co., Portland, Oreg.; plans prepared, bids soon.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2700 tons, municipal filtration plant, Philadelphia, through Progressive Construction Co., that city, to Bethlehem Steel Co.

938 tons, Wacker drive extension, Chicago, through Herlihy Mid-Continent Co., to Joseph T. Ryerson & Son Inc., Chicago.

800 tons, apartment building, Sheridan Rd., Chicago, to Truscon Steel Co., that city.

693 tons, tuberculosis sanitarium, Chicago, to Ceco Steel Products Co., Cicero, Ill.

385 tons, sewers, Elyria, O., to Builders Structural Steel Co., Cleveland.

350 tons, new agricultural library, Cornell University, Ithaca, N. Y., to Buffalo Steel Co., Buffalo.

250 tons, Broad street substation for light department, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; S. S. Mullen Co., Seattle, general contractor.

161 tons, Washington Park YMCA, Chicago, through Algot B. Larson Inc., to Joseph T. Ryerson & Son Inc., that city.

150 tons, University of Washington underpass, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Henrik Valle, Seattle, general contractor.

137 tons, Ohio state highway project FG687, Ravenna, O., to Truscon Steel Co., Youngstown.

125 tons, miscellaneous, including state bridge, Palouse river, warehouse for Seattle Iron & Metal Co., and others, to Bethlehem Pacific Coast Steel Corp., Seattle.

Unstated, Lincoln state school, Lincoln, Ill., to Laclede Steel Co., St. Louis.

REINFORCING BARS PENDING

1700 tons, Park Manor apartments, Ritten House street, Philadelphia; Ring Construction Co., Washington, general contractor.

438 tons, water works system, Bedford Park, Ill.; bids asked.

385 tons, water works improvements, Cedar Rapids, Iowa; Gust & Green Co. apparently low on general contract.

297 tons, site No. 1, Chicago Housing thority apartments; Jacobson Bros. Co., cago, apparently low on general contra

195 tons, Sherman hospital, Elgin, Ill.; asked.

195 tons, sewage treatment plant, Rock Ill.; bids asked.

170 tons, tunnel, Michael Reese hospital, cago; bids asked.

156 tons, state bridge, Westmoreland co Pennsylvania; bids closed Oct. 8.

115 tons, building, Farm Bureau Co-oper Ass'n., Columbus, O.; bids asked.

107 tons, produce warehouse, Cleveland; asked.

105 tons, Agriculture & Chemistry build Purdue University, Lafayette, Ind.; asked.

Unstated, Illinois research hospital, Chic bids Oct. 25.

Unstated, $360,000 assembly plant for Ka Frazer Corp., Portland, Oreg.; bids in 17; plans by Wolff & Phillips, Portla

Unstated, aircraft shop building, Ladd Force Field near Fairbanks, Alaska; C land Construction Co., Bellingham, W low, $296,660.

PLATES . . .

PLATES PENDING

1400 tons, Lucky Peak project tunnel li bids to U. S. Engineer, Walla Walla, W Oct. 20.

Unstated aircraft shop building, Ladd Force Field near Fairbanks, Alaska; Co., Portland, Oreg., low $112,530, to reau of Reclamation, Denver.

PIPE . . .

CAST IRON PIPE PLACED

800 tons, 6, 8 and 10-inch, North Rayn Mass., to R. D. Wood Co., Florence, N

550 tons, 6 to 12-inch, Westfield, Mass United States Pipe & Foundry Co., Bu ton, N. J., through contractor.

550 tons, 6 to 12-inch, Winthrop, Mass R. D. Wood Co., Florence, N. J.

250 tons, Pullman, Wash., system extens to Pacific States Cast Iron Pipe Co., land, Oreg.

230 tons, 20-inch, Middletown, Conn. Warren Pipe Co., Everett, Mass.

CAST IRON PIPE PENDING

1200 tons, 8 to 12-inch, Attleboro, Mass.; in Oct. 19.

500 tons, 36-inch, Logan airport, Boston; in.

CONSTRUCTION AND ENTERPRISE

ARKANSAS

PINE BLUFF, ARK.—Arkansas Pow Light Co. has plans in progress for building, cost $500,000.

CALIFORNIA

LOS ANGELES—Board of Harbor Cor sioners will build a $6 million passe cargo terminal for use by Matson gation Co. in Los Angeles harbor. P will include a 2270-foot wharf and single-span fireproof transit sheds. for the first phases of construction be called within 90 days.

TORRANCE, CALIF.—Pittsburgh Plate Co. expects shortly to sign contract construction of a $1,250,000 paint on Crenshaw Blvd.; general contrac erection of the plant has been award MacIssac & Menke, Los Angeles co tor.

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ucts Co., 6467 N. Avondale St., Chicago, has awarded the general contract for construction of a factory building at 8020 N. Austin Ave. to E. W. Johansen, 3853 N. Keeler St., Chicago, at approximately $72,000. Frank L. Glick, 3938 N. Central St., Chicago, architect.

OHIO

CANTON, O.—Incorporation papers have been filed for the Industrial Chrome Corp., an established firm at 116 Seventh St., by Mildred E. Lawson, Karl A. Feist and Maurice W. Wendling, attorney, also agent, 618 Renkert Bldg.

CLEVELAND—Edwin J. Gilles has formed Gilles Machinery Co., 413 Caxton Bldg., to continue to represent machine tool manufacturers. Among the lines will be: Hendey Machine Co., Gallmeyer & Livingston Co., Cleveland Planer Co., Armstrong-Blum Co. and Cushman Church Co. Mr. Gilles was half owner of Jeffery-Gilles Co., which was dissolved Aug. 31.

CLEVELAND—Parma Sheet Metal Inc. has been incorporated to manufacture and deal in sheet metal products. Incorporators are Vesyl Kirschstein, Lois D. Coriell and Alma L. Aurelius, wife of Earl M. Aurelius, attorney, 630 Williamson Bldg., who filed the incorporation papers.

FOSTORIA, O.—Fostoria Screw Co. has been purchased by a group of Cincinnatians, composed of Sidney Rose, 1400 Harrison St.; Philip Moskowitz, 3901 Ledgewood; Ben Moskowitz, 4148 Paddock Rd.; Joseph Hoodin and Fred Weiland, attorneys, Enquirer Bldg. The purchase was made from Bowser Inc., Fort Wayne, Ind. This group also acquired Merritt-Monsanto Co., Lockport, N. Y., a wholly-owned subsidiary of Monsanto Chemical Co., from which it was purchased. It will operate as Merritt Engineering Co., manufacturing and designing machinery to convert logs into plywood.

PENNSYLVANIA

SOMERSET, PA.—Peter F. Loftus Corp., engineer, Oliver Blvd., Pittsburgh, has been selected to prepare plans and specifications for Project No. G. S. A. 512-2 for construction of a new boiler plant at Somerset State Hospital.

WASHINGTON

SEATTLE—Contractors' bids will be opened next month for construction of a $1 million transmitter building, central part of a new Naval radio station designed to be the most powerful in the world, to be located at Jim Creek, Snohomish county.

CANADA

HAMILTON, ONT.—Construction will get underway at once on a $175,000 two and a half story warehouse building for T. Eaton Co. on Rebecca St.

FERROALLOYS

(Concluded from Page 103)

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 1% max.), $3. **Primos and High Speed G** (Va 35-55%, Si 1.50% max., C 0.20% m $3.10.

Grainal: Vanadium Grainal No. 1, 93c; N 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload $1.20 per lb of contained V_2O_5, freigh lowed. Spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,0 W or more, $2.25 per lb of contained 2000 lb W to 10,000 lb W, $2.35; less 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Con or spot, 1000 lb or more, $2.90 per lb of tained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloys: (Zr 12-15%, S 43%, Fe 40-45%, C 0.20% max.). Cont c.l., lump, bulk 6.6c per lb of alloy, c.l. pa 7.35c, ton lot 8.1c, less ton 8.95c. Deliv Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, S 52%, Fe 8-12%, C 0.50% max.). Cont carload, lump, packed 20.25c per lb of ton lot 21c, less ton 22.25c. Freight allo Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% r Al 0.50% max., C 0.50% max.). Cont 100 lb or more, 1" x D, $1.20 per lb o loy. Less than 100 lb $1.30. Delivered. add 5c. F.o.b. Washington, Pa., prices lb and over are as follows: Grade A 14% B) 75c per pound; Grade B (14-18% $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.2 lb contained B, f.o.b. Philo, O., with fr not to exceed railroad freight allowed to tination.

Bortam: (B 1.5-1.9%). Ton lots, 45c pe smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net to carload, 8c per lb, f.o.b. Suspension Br N. Y., freight allowed same as high-c ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Mn 5% r Si 8% max., C 0.5% max.). Contract, to 2" x D, $2.90 per lb of contained Cb, les $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 1.25%, C 3.50-5%). Carload, 12 M x D, load packed 19.0c per lb of material, to 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Ca packed. 1" x D, 43c per lb of alloy lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr Fe 20% approx.). Contract, carload, pa ½" x 12 M, 16.5c per lb of alloy, ton 17.50c, less ton 18.5c. Delivered. Spot, 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, 11%). C.l. packed, 17.00c per lb of alloy lots 18.00c; less ton lots 19.50c, f.o.b. Nia Falls, N. Y.; freight allowed to St. Loui

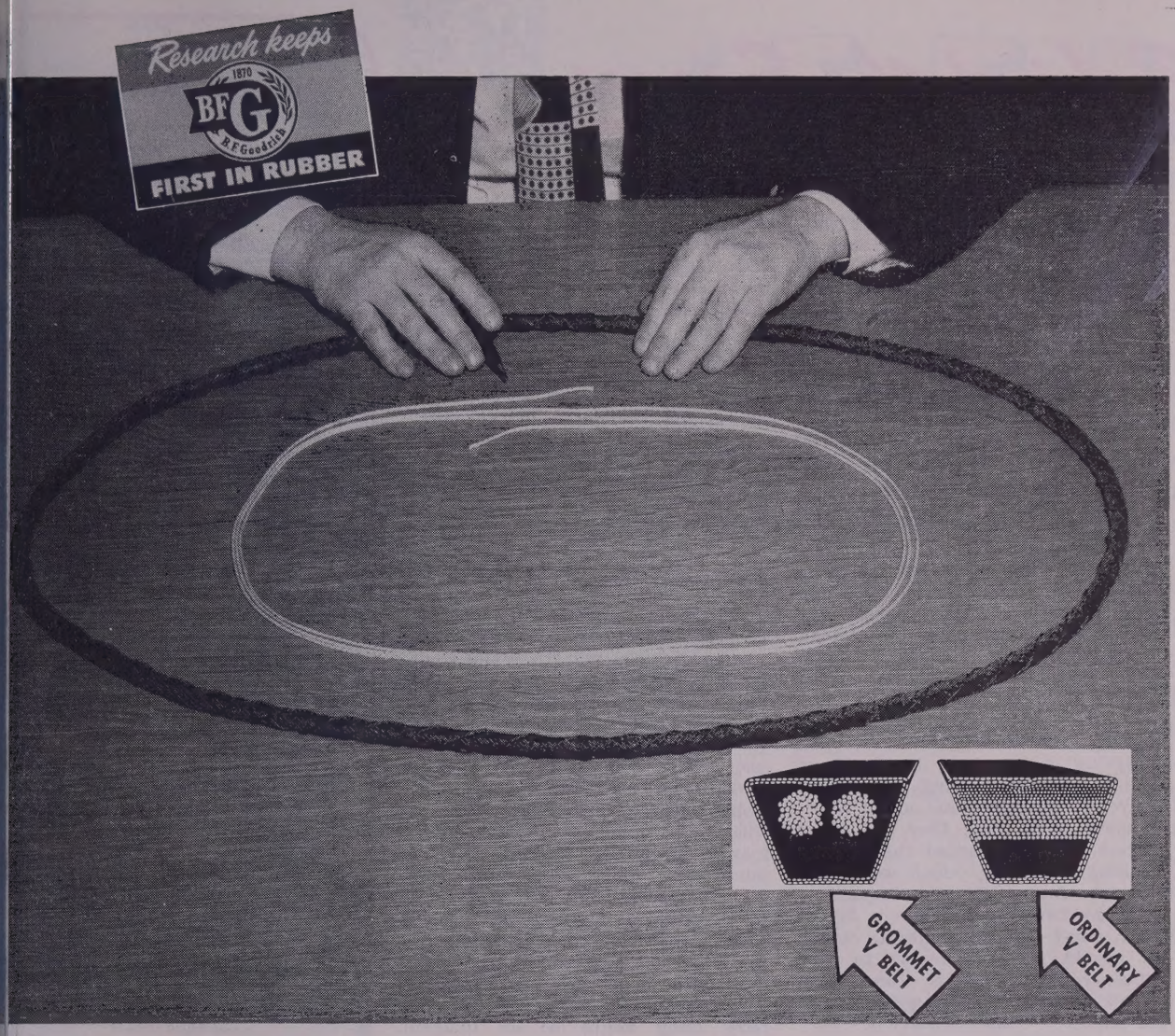
V-5 Foundry Alloy: (Cr 38-42%, Si 17- Mn 8-11%). C.l. packed, 14.25c per alloy; ton lots 15.75c; less ton lots 1 f.o.b., Niagara Falls, N. Y.; freight al to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Lump, bulk, carload 11.00c. Ton lots, 11.50c, packed 11.75c. Less ton lots, p 12.55c per lb of alloy, f.o.b. Philo, O., freight not to exceed railroad freight al to destination.

Ferrophosphorus (23-25% based on 24% P tent with unitage of $3 for each 1% above or below the base); Gross tons pe load, f.o.b. seller's works, Mt. Pleasan Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, tained Mo, f.o.b. Langeloth and Washi Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, con Mo., f.o.b. Langeloth and Washington, packed in bags containing 20 lb of denum, 95.00c.



What is this thing called a grommet?

New B. F. Goodrich grommet V belts cut costs 20 to 50%

No—a grommet is not an ordinary cable. It is a patented construction in which heavy cord is wound on itself to form an endless loop. An ordinary cable is merely a twisted cord, the ends of which must be overlapped to make a loop. (See the picture above.) The difference is important to you, because a B. F. Goodrich grommet V belt delivers 20 to 50% more V belt life *at no extra cost.*

Grommet belts are more flexible—They have no splice, no stiff section where cords overlap (85% of failures of ordinary belts occur in overlapped sections). B. F. Goodrich belts have no grommets, no fabric or plies in the middle of the belt that stiffen it and generate heat. They have more elasticity, less permanent stretch than any other belt.

Stand shocks better—Actual running tests in field and laboratory show that B. F. Goodrich grommet V belts have a higher safety factor, much greater ability to withstand shock load than do ordinary V belts—actually lasted 20 to 50% longer!

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Only BFG has the grommet belt—Twin grommet construction is an exclusive, patented B. F. Goodrich development (U.S. Patent No. 2,233,294). Make sure you get genuine grommet V belts, (for the present made only in the larger—the D and E sizes). Ask your BFG salesman to show you his "X-ray" belt that illustrates grommet construction clearly. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Grommet V Belts BY

B.F.Goodrich

Behind the Scenes . . .

Last of the Show

May seem to you like a lot of ancient history by now, seeing as how it's already Hallowe'en, but we're fresh from the Metal Show while we write this, and we'd like to thank all of you nice people who stopped by our booth to say hello. There were quite a few of you, and we were overwhelmed. The booth was real sharp, too. Hit of the show, and all that sort of thing. Our flowers never did get tired, and that soft new furniture was well sat on all week. In fact, we'd like to have had some more time to wander around and find out about things. Never did get a chance to pick up some of those whistles from Lindberg Engineering, or some of those junior barrels that Alcoa was turning out by the carload lot. We liked very much the soft foam rubber mat under that carpet in the Stokes Machine booth, and almost gave up drinking when one of those Westinghouse birds suddenly stopped munching on its food, looked us straight in the eye, and said, *"How* are you?" We asked one of the Westinghouse boys what they fed those critters, and we learned that it was mocking bird food, which seems appropriate for anything as loquacious as those two! There were a lot of other non-technical highspots which we should probably report to you, but since we have a few other things to talk about this week, we'll have to get on.

In This Issue

Don't forget to catch Walt Campbell's pension plan perusal this week. Easy to find. Just take a quick walk back to the news section and it will be right there, staring you in the face. And back in our production-engineering section you'll find the start of a series on stainless, from out of Carpenter Steel. While you're back there, take a look at Doc Gray's opus on chemical finishes on aluminum. Mighty fine stuff to know about.

Rounder Proof

We were stopped dead in our tracks while going through last week's book. We came across a metalworking company whose products include rounder proofers. Now it may be that you are completely familiar with rounder proofers, and that our surprise is unfounded. But in any case, we were intrigued. With a good rounder proofer in your vest pocket, you might be able to make spot analyses of characters who confront you from time to time. With a whistle, or bell, or flashing light, the device would be invaluable. While engaged in conversation with a stranger, you could relax and be comfortable, knowing that if he were of questionable nature, your little bell or whistle or light would go off. You could then stand stanchly before him, present the evidence, and in a loud voice proclaim, "You, sir, are a rounder!" before curtly turning on your heel and stalking into the distance, head held high. Some day we're going to have to look into the facts and find out what a rounder proofer really is!

Art for Art Dept.'s Sake

John Morgan, of our editorial staff, says we should tell you folks about our art department. It's really something to talk about, too. All those fancy new charts, the streamlined statistical presentations and so forth you've been seeing in the past few issues have come out of the Green Room. Our Art Dept. is all refurnished with new gray metal furniture, with green upholstery on the chairs, foam rubber and all that sort of thing. The walls are a pale green, new fluorescent lights dazzle the eyes of us ordinary workers, and everybody from Don Cadot in his Art Editor's chair to Lazy Lucy back in the southeast corner has taken on new atmosphere. Lest anybody think Lazy Lucy might be an indigent female artiste, we hasten to add that she's a gimmick, designed to make big pictures out of little ones.

Puzzle Corner

In last week's puzzle, the star enclosed 112.26 square inches, while there were 201.9 square inches in the circle but not in the star. By a strange coincidence, those two figures add up to 10 pi, which they should. Here's a quickie, good for about thirty seconds of your time if you have good powers of visualization: A small gear has eight teeth, numbered one to eight. It is meshed with a 24-tooth gear. If the small gear starts at the bottom of the large gear with the number 1 in a vertical position, and is revolved around the large gear, how many times will the number 1 be in a vertical position in one complete revolution?

Shrdlu

(Editorial Index—page 9)

STEEL

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